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1957

Special Summer Session Highlights

Institute for High School Teachers of Mathematics

Education Workshop in the Unit Method of Curricula Development (Meeting Individual Differences)

American Studies Concentration

Driver Education Instructor Course

Graduate Courses in French, German, and Spanish

Courses in Engineering, Forestry, and Nursing

Field Course in Conservation of Natural Resources

Special Days Devoted to Foreign Lands and People

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CALENDAR FOR SIX WEEK SESSION

July 1, Monday, 1-5 P.M., Registration, Memorial Hall.

July 2, Tuesday, 8 A.M., Classes begin.

July 4, Independence Day, No University exercises.

August 9-10, Friday, Saturday, Final examinations.

August 10, Saturday, 12 noon, end of Summer Session

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Registration for other summer courses at Registrar's Office, South College, on the first day of the session.

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UNIVERSITY OF MASSACHUSETTS
SUMMER SESSIONS
1957

MAIN SESSION . . . . JULY 1 — AUGUST 10
SPECIAL COURSES . . . . JUNE 3 — SEPTEMBER 6

Programs Offered

Among the special features is a program of courses and allied activities in American Studies which should be of particular interest to English and History teachers, and other students and teachers taking work for professional improvement. Four courses in English (English 85 and 86, Major American Writers, English 87, Problems in American Literary and Linguistic Studies, and English 90, The United States, 1920-1940) will be offered; one course in the History of American Westward Expansion (History 72); two courses in American Government (Government 25) and The Presidency in American Government (Government 55); two courses in Elements of American Economy (Economics 25) and Problems of American Economy (Economics 26); and one course in American Pragmatism (Philosophy 67).

As in previous years the University and the College English Association, through its national office on campus, are arranging a three-day Seminar on American Studies during the period June 28-30, and several well-known scholars and writers will be in attendance to lead panel discussions and hold conferences with interested students. The University's location in the heart of a region that is rich in cultural association is a very real advantage for the program.

During the 1957 Summer Sessions the University for the first time will offer three-week Workshops in American Studies from June 17 to July 5. Designed especially for students and teachers, the Workshop will present a choice of one of two courses. The first course, English 87, places emphasis on the exploration of problems connected with the teaching of American language and literature in the context of American culture. The second course, English 90, is an interdepartmental approach to the study of major developments in American life during the two decades after the World War I. Classes during these Workshops will be arranged so that students and teachers who want to enroll in courses during the main session beginning July 1 will be able to do so without a conflict in schedule.

Two courses taking advantage of the location of the University in the Connecticut Valley will also be offered. These courses will include field work and observation as basic parts of their programs. A course on the Conservation of Natural Resources (Wildlife Management 52, 152)* will be taught with the help of a number of distinguished lecturers and leaders in the field of conservation. The basic course in Botany will have the surrounding area as its laboratory.

Two courses in music will be offered by the Department of Music during the main session. Discovering Music (Music 51) is a non-technical course designed primarily for students desiring a general background and knowledge of this art. Music in the Elementary Grades (Music 62) deals with the principles

* A special announcement pertaining to this course may be obtained upon request to the Department of Forestry and Wildlife Management.

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of musical development with particular emphasis on classroom presentation. These two courses do not require prerequisites, other than enthusiasm and learning as a motive.

A workshop in Education (Education 215), of interest to school administrators and teachers in the fields of elementary and secondary school curriculum, will be held June 10-29. Several consultants from the State Department of Education, and other school systems and university Schools of Education will assist the faculty of the University in conducting the workshop. Attention will be given largely to the use of the unit technique to meet individual differences with particular emphasis on the superior pupil. The other varied courses in Education will benefit teachers and those who wish to prepare themselves for teaching.

Special courses in Engineering (Chemical, Civil, and Mechanical), Forestry, and Nursing will also be offered.

In cooperation with the Center for Safety Education of New York University, a two-week Driver Education Instructor Course (Physical Education 80, 180) will be offered June 24-July 5. This course prepares teachers seeking certification to teach driver education in secondary schools.

A series of "Days for Pan-American Understanding" of interest to teachers, adults residing in the area, and students and faculty at the University and nearby schools and colleges are included as part of the main (six-week) Summer Session program. The "Days," which will be supplemented in depth by the course Spanish 87 and Romance Language 187 (Latin-American Seminar: Problems and Protest in Recent Spanish-American Literature), but can be followed with profit independently, will be devoted to creating a better understanding of our Western Hemisphere co-citizens. Representatives from the embassies of the countries under consideration, foreign students and visitors, together with U. S. scholars and government officials concerned with these lands, will spend one or more days on the campus. A typical day will include a luncheon, afternoon discussion, films, informal visiting and conversation, dinner at the University Dining Commons, and panel discussions in the evening. Popular attitudes in this country towards our inter-American neighbors as well as official U. S. foreign policy in the other Americas will be examined.

Credit for Summer Work

All courses carry degree credit and are equivalent in method, content and credit to courses offered in the University during the regular academic year. Credits obtained in these courses are ordinarily accepted as transfer credits by other colleges and universities. Students desiring to pursue courses for advanced degrees must seek the approval of the Dean of the Graduate School.

Amount of Work Permitted

Students attending the main Summer Session usually carry two courses, enabling them to earn six or seven semester hours credit. University of Massachusetts undergraduates will receive permission to take more than two courses only if their scholastic average has been 3.0 quality point or better for the last two semesters. A student from another college can enroll for more than two courses only if the appropriate official of his own college submits a statement recommending such a program and certifying that he is an honor student at that institution.

Expenses

Tuition for residents of Massachusetts	$ 5.00	per credit hour
Tuition for non-residents of Massachusetts	10.00	per credit hour
Student Health and Activities Fee	2.00	
Student Union Fee for six-week session	4.00	
Room rent for six weeks	35.00	
Board for six weeks (Monday through Friday) at $9.50 per week	57.00	

Advance Enrollment

To expedite advance enrollment or to obtain approval of admission, students contemplating attendance should notify the Registrar as soon as possible, using the application form on the last page of this bulletin.

Veterans and Residents

Veterans who plan to enroll under the G. I. Bill (P.L. 550) should present not later than the time of registration evidence of eligibility or else make application for training at that time. Students already enrolled under P.L. 550 should re-enroll for Summer Session work. Under this law, veterans receive an education and training allowance from the Veterans Administration from which they pay their own university fees and purchase their own books and supplies.

RESOURCES OF THE UNIVERSITY

During Summer Sessions the facilities of the University are at the disposal of students. In addition to the classrooms, the laboratories, and library facilities available for student use, a number of other agencies and services are offered.

University Health Service

Medical consultation and treatment is available to students at the University infirmary. The infirmary, located east of the Dining Commons, furnishes ordinary medical care for students.

Residence Halls and Meals

Assignment of rooms in University residence dormitories is made on the session basis with room payments due not later than the beginning of the session. The Summer Session residence period is from July 1 to August 10 in most cases (main session). Students are also accommodated for periods before and after the main session. Men will be housed in Mills dormitory and women in Crabtree dormitory. Meals will be provided to students at the Dining Commons during the main session only. Students residing in residence dormitories during this session are required by University regulations to take their meals in the University Dining Commons. Meal tickets, on a five-day basis (Monday through Friday), may be secured at the Dining Commons after payment of the bill at the Treasurer's Office. Cafeteria service will be available in the coffee shop of the Student Union Building during all sessions for other students desiring food service. Married couples should write to the Housing Office at the University regarding housing accommodations. Although there is no housing available on campus for Summer Session students, the office ordinarily has such listings which are located in close proximity to the campus.

Recreation and Entertainment

In planning for its students, the importance of recreation, entertainment, and relaxation are recognized. The natural environment in which the University is located affords almost unlimited facilities for combining recreation activities with academic and professional achievement. Indoor and outdoor extra-curricular activities designed to meet varying interests of individuals are planned. Such features as band concerts, movies, and square dances will be scheduled. In addition, programs for recreation offering many informal sports such as swimming, softball, baseball, tennis and hiking will be arranged. Special lectures and entertainment, such as a trip to the Berkshire Music Festival at Tanglewood and a play at Mountain Park will also be provided. A get-acquainted picnic will be scheduled during the first week of the main session. A golf course, located within five minutes driving time from the University campus, is available to students upon payment of green fees.

The new Student Union Building, truly a "Hub" of student activity and social life, serves as a recreational center and common meeting place for students. Modernly furnished, the Union includes lounges, music listening rooms, reading rooms, game and recreation rooms, bowling alleys, ballrooms and a coffee shop.

INSTITUTE FOR HIGH SCHOOL TEACHERS OF MATHEMATICS

There is an increasing scarcity of teachers trained in Mathematics. To improve their own knowledge of Mathematics and to increase their ability to stimulate talented young people to prepare for careers in Mathematics, the National Science Foundation is cooperating with the University of Massachusetts and Smith College in planning an institute for high school teachers of Mathematics. The program will be seven weeks in length, beginning on July 1 and ending on August 16, 1957.

The purpose of this institute is to promote learning through informal class discussions, a workshop, and solid content courses in Mathematics. The institute plans to integrate these functions so as to provide a stimulating educational experience, to hold discussions of mutual teaching problems, and to suggest new teaching aids, methods, and techniques. Each participant will carry out a project which is related to the individual's work and to some aspect of the institute program.

Stipends will be available for qualified applicants, and will cover instructional fees, travel, living expenses, reasonable incidentals, and some compensation for time that might normally be utilized for employment during the summer. In addition, modest allowances will be provided for dependents of applicants receiving stipends.

Complete information pertaining to the institute and application forms for admission and for a stipend may be obtained upon request to Dr. Robert W. Wagner, University of Massachusetts, Department of Mathematics, Machmer Hall, Amherst, Mass.

COURSE DIRECTORY
(MAIN SESSION)

The University reserves, for itself and its departments, the right to withdraw or change the announcements made in this catalogue.

Courses numbered 1-99 carry undergraduate credit only. Those numbered 200 or over admit graduate students only. Courses numbered 100-199 are undergraduate courses for which graduate students may receive graduate credit with the completion of additional requirements as determined by the instructor.

BOTANY 1. Introductory Botany. The morphology and physiology of plants.
1 - 1:50 MTWTF, Clark Hall 105 — Credit 3
2 - 3:50 MTWT, Clark Hall 202 — Mr. Wright

ECONOMICS 25. Elements of Economics. Definitions and introductory principles of production, exchange, and the financial organization of society, with a short survey of the economics of distribution and the use of wealth and income. Credit 3
9:20 - 10:30 MTWTF, Machmer W35 — Mr. Vatter

ECONOMICS 26. Problems of the American Economy. A continuation of course 25. Current problems, including international economic relations, the determination and distribution of the national income, and the place of economic planning in peace and war are discussed. Credit 3
8 - 9:10 MTWTF, Machmer W35 — Mr. Vatter
Prerequisite, Economics 25.

EDUCATION 62, 162. Elementary School Arithmetic. Methods and materials in teaching arithmetic in elementary grades and correlating it with the total program. Credit 3
8 - 9:10 MTWTF, Machmer E32 — Miss McManamy

EDUCATION 64, 164. Principles of Elementary Education. This course is designed to acquaint the student with the aim, organization, program, pupil population, etc., of the elementary school and the relationship between this level of education and the secondary school level which follows. Credit 3
3 class hours — Miss McManamy
10:40 - 11:50 MTWTF, Machmer E34

EDUCATION 66, 166. Audio-Visual Aids in Teaching. A wide variety of aids studied from the point of view of how they may be used effectively in teaching. Credit 3
9:20 - 10:30 MTWTF, Machmer E36 — Mr. Wyman

EDUCATION 83, 183. Principles of Secondary Education. Aims, pupil population, program, guidance, problems and trends of junior and senior high school. Credit 3
8 - 9:10 MTWTF, Machmer E34 — Mr. Fennell

EDUCATION 210. Administering Extra-Curricular Activities. Scheduling, financing, sponsorship, regulation of pupil participation. Credit 2-3
8 - 9:10 MTWTF, Machmer E33 — Mr. Oliver

EDUCATION 211. Community Relations for School Personnel. The development of good public relations, policies and techniques of assisting lay people in interpreting school activities, policies, and objectives. Credit 3
10:40 - 11:50 MTWTF, Machmer E33 — Mr. Oliver

EDUCATION 214. Principles of Supervision. Principles and problems of supervision and the exercise of educational leadership in the improvement of instruction in the elementary curriculum and the secondary school content fields. Credit 3
9:20 - 10:30 MTWTF, Machmer E34 Mr. Fennell

EDUCATION 258. Implementing the Elementary School Program. An advanced course in curriculum design and classroom organization. It includes practices in planning, presenting, and evaluating programs involving integration of skills and activities for the various grade levels. Credit 3
9:20 - 10:30 MTWTF, Machmer E32 Miss O'Leary
Prerequisite, Education 160, and teaching experience

EDUCATION 265. Techniques in Remedial Reading. Methods and materials in diagnosis and remedial instruction. Credit 3
10:40 - 11:50 MTWTF, Machmer E32 Miss O'Leary

EDUCATION 267. Construction of Audio-Visual Aids. An advanced course designed to help teachers and audio-visual specialists to prepare audio-visual materials for use in an educational program. Students will prepare slides, graphics, recordings, still pictures, motion pictures. Credit 3
9:20 - 10:30 MTWTF, South College Mr. Curtis
Prerequisite, Education 166

ENGLISH 25, 26. Humane Letters. A general reading course based upon a chronological selection of masterpieces: classical, continental and English.
English 25, 8 - 9:10 MTWTF, Old Chapel B Credit 3
Mr. Helming
English 26, 10:40 - 11:50 MTWTF, Machmer E17 Credit 3
Mr. Koehler

ENGLISH 68, 168. Modern Drama. This course traces the development of continental English and American drama from the time of Ibsen to the present day. Credit 3
8 - 9:10 MTWTF, Old Chapel D Mr. Williams

ENGLISH 77, 177. The Modern Novel. An analytical presentation of eleven novels written between 1890 and 1930 in which the expanding form and the extension of critical themes will be stressed. Credit 3
10:40 - 11:50 MTWTF, Old Chapel D Mr. Lane

ENGLISH 85, 185. Major American Writers. A study of a selected group of the major American writers of the nineteenth and early twentieth century. The authors to be read and discussed will include Emerson, Hawthorne, Longfellow, Lowell, Henry James, Henry Adams, Fitzgerald, and Hemingway. A careful analysis will be made of the varying literary forms given to such dominant themes as nature and the conflict between the individual and society. Credit 3
9:20 - 10:30 MTWTF, Old Chapel D Mr. Rudin

ENGLISH 86, 186. Major American Writers. A study of a selected group of major American writers of the nineteenth and early twentieth century. The authors to be read and discussed include Cooper, Poe, Melville, Thoreau, Whitman, Mark Twain, Stephen Crane, Sinclair Lewis, and Faulkner. A careful analysis will be made of the varying literary forms given to such dominant themes as nature and the conflict between the individual and society. Credit 3
10:40 - 11:50 MTWTF, Old Chapel B Mr. Lloyd

FRENCH. Graduate Reading Course. For graduate students wishing to prepare for the graduate reading examination. No Credit
8 - 9:10 MTWTF, Machmer W23 Mr. Johnson

GERMAN 2. Elementary German. Second semester of elementary German.
10:40 - 11:50 MTWTF, Machmer W13 Credit 3
Mr. Heller

GERMAN. Graduate Reading Course. For graduate students wishing to prepare for the graduate reading examination. No Credit
8 - 9:10 MTWTF, Machmer W13 Mr. Heller

GOVERNMENT 25. American Government. A study of the principles, machinery, dynamics and problems of American national government. Credit 3
9:20 - 10:30 MTWTF, Machmer E25 Mr. Goodwin

GOVERNMENT 55. The Presidency in American Government. The growth of the executive in United States Government. Varying conceptions of the presidential office. Constitutional and political aspects of the office in legislation, administration and conduct of foreign and military affairs. The president as party leader. Credit 3
10:40 - 11:50 MTWTF, Machmer E25 Mr. Harris
Prerequisite, Government 25.

HISTORY 6. Modern European Civilization. A basic survey course covering the period from 1815 to the present. Credit 3
10:40 - 11:50 MTWTF, Old Chapel C Mr. Gagnon

HISTORY 56. History of Russia. A general historical introduction to the civilization and contemporary problems of Russia. Growth of the Russian state, society, culture and ideology, and their relations to the non-Russian world. Emphasis on the Soviet period. Credit 3
8 - 9:10 MTWTF, Old Chapel C Mr. Gagnon

HISTORY 72. History of American Westward Expansion, 1763-1893. Advance of settlement from the Appalachians to the Pacific and influence of the frontier upon social, economic, and political conditions in the country as a whole. Credit 3
9:20 - 10:30 MTWTF, Old Chapel C Mr. Davis
Prerequisite, History 59.

MATHEMATICS 6. Introductory Calculus for Engineers. May be used as a substitute for Mathematics 29, Differential Calculus. Differentiation, with applications; technique of integration. Credit 4
Section I, 10:40 - 12:20 MTWTF, Machmer W31 Miss Cullen
Section II, 10:40 - 12:20 MTWTF, Machmer W37 Mr. Boutelle
Prerequisites, Algebra, Trigonometry and Plane Analytic Geometry.

MATHEMATICS 7. Algebra and Trigonometry. Fractions, quadratic equations, exponents, logarithms, variation, determinants of the second and third orders, and plane trigonometry. Credit 3
9:20 - 10:30 MTWTF, Machmer W31 Mr. Boutelle

MATHEMATICS 10. Algebra and Analytic Geometry. This course is designed for the freshmen who plan to take Calculus. Theory of equations, binomial theorem, determinants of higher order, and plane analytic geometry. Credit 3
8 - 9:10 MTWTF, Machmer W31 Miss Cullen

MUSIC 51. Discovering Music. This elementary course is non-technical and is designed primarily for students desiring a general background and knowledge of this art. With learning to listen as its motive, the course deals with the elements of music, forms in music, music compositions and composers. Excerpts from works most frequently heard and performed will be used as illustrations. Credit 3
10:40 - 11:50 MTWTF, Memorial Hall Mr. Contino

MUSIC 62. Music in the Elementary Grades. Designed for the classroom teacher having little or no formal training in music, this course deals with the principles of musical development with particular emphasis on classroom presentation. Using the class as a laboratory, rote and reading songs are examined and processes of presentation evaluated. Credit 3
9:20 - 10:30 MTWTF, Memorial Hall Mr. Contino

PHILOSOPHY 67, 167. American Pragmatism. A study of the characteristically American reinterpretations of the main strands of western thought and of uniquely American contributions to philosophy. The sources of pragmatism in New England thought and in the American experience will be explored. Intensive study will be made of the works of William James and John Dewey. Credit 3
8 - 9:10 MTWTF, Machmer E15 Mr. Rogers

PHILOSOPHY 266. Philosophy of Education. An evaluation of various educational theories and practices viewed in the light of historical perspective and contemporary thought. Credit 3
10:40 - 11:50 MTWTF, Machmer E15 Mr. Rogers

PSYCHOLOGY 26. General Psychology. An introductory course dealing with the basic principles and applications of psychology with regard to the understanding and control of behavior. Credit 3
10:40 - 11:50 MTWTF, Machmer W15 Mr. Kates

PSYCHOLOGY 77, 177. Mental Hygiene. A study of the nature and problems of adjustment and of individual mental health. Topics considered include: motivation, frustration, conflict, modes of adjustment and behavior deviations. Applications of mental hygiene to the home and school are stressed. Credit 3
10:40 - 11:50 MTWTF, Machmer W17 Mr. Neet
Prerequisite: Psychology 26 or the equivalent.

PSYCHOLOGY 245. The Psychology of Exceptional Children. A consideration of the etiology, diagnosis, and treatment of exceptional children. Special emphasis will be placed on intellectual, social, physical and sensory deviations. Credit 3
9:20 - 10:30 MTWTF, Machmer W15 Mr. Kates
Prerequisites, Psychology 82 or 182, 83 or 235, 94 or 194.
Students having only two of these three prerequisites may take the course on consent of the instructor.

SOCIOLOGY 25. Introduction to Sociology. An outline study of the social order and of the individual considered as a member of his various groups.
9:20 - 10:30 MTWTF, Machmer E37 Credit 3
Mr. Driver

SOCIOLOGY 53, 153. An Introductory Study of Cultural Anthropology. A non-technical sociological study of man in preliterate societies. Credit 3
8 - 9:10 MTWTF, Machmer E37 Mr. Wilkinson
Prerequisite, Sociology 25.

SPANISH 2. Elementary Spanish. The essentials of Spanish grammar, intensive oral drill and intensive reading of short stories. Credit 3
10:40 - 11:50 MTWTF, Machmer W23 Mr. Johnson
Prerequisite, Spanish 1

SPANISH 87 and ROMANCE LANGUAGE 187. Latin-American Seminar: Problems and Protest in Recent Spanish-American Literature. Representative modern and contemporary writers will be studied as source material for understanding the mores and problems of life in Latin America, particularly as they focus attention on the forces for social and political change. There will be brief lectures; with extensive discussions, readings, and reports. A knowledge of Spanish is not required, as the authors will be read in English translation wherever possible. Students who can read Spanish and Portuguese will be urged to read the material in the original language. Credit 3
9:20 - 10:30 MTWTF, Machmer W23 Mr. Wexler

SPEECH 76, 176. Stage Direction. Study and practice in the fundamentals of directing a play. Recommended for those taking only one course in Drama. Credit 3
10:40 - 11:50 MTWTF, Bowker Mr. Peirce

SPEECH 91, 191. Extempore Speech. The theory and practice of public speaking for business and professional purposes. Credit 3
9:20 - 10:30 MTWTF, Old Chapel Auditorium Mr. Harper

WILDLIFE MANAGEMENT 52, 152. Conservation of Natural Resources. A description of, and conservation of basic natural resources including soil, water, forest, wildlife, metallic and non-metallic minerals and the sources of energy including atomic energy. Course includes lectures, demonstrations, and field exercises. Credit 4
1 - 3 MWF, 1 - 5 TT, Conservation Building Mr. Trippensee, Coordinator

SPECIAL COURSES

Department of Education

EDUCATION 72, 172. Vocational Education in Agriculture. This course demands certain requisites of experience and a definite objective on the part of the student to enter the field of vocational agricultural teaching which makes it necessary for the student to seek permission to enter the course. It is the first of the series of special courses (72, 73, 75) required of undergraduate candidates for the vocational teacher-training certificate. A survey of vocational agricultural education and an introduction to teaching of vocational agriculture at the secondary school level is the basis of the course. Certain information and observations in preparation for the apprenticeship course are offered. Credit 3

June 10-29. Hours by arrangement. Mr. Oliver

Machmer E35

EDUCATION 75, 175. Technique of Teaching Vocational Agriculture. This course covers the materials, methods, policies, and special requirements of Massachusetts for teaching vocational agriculture and related subjects in high schools and special country schools. This is one of three courses required of candidates for agricultural teacher training certificates. Credit 3

June 10-29. Hours by arrangement. Mr. Oliver

Machmer E35

Prerequisite, Education 72, or permission of instructor.

EDUCATION 215. Workshop in Elementary and Secondary Curriculum, Unit II, Meeting Individual Differences. For administrators, supervisors, elementary and secondary school teachers; attention given largely to the use of the unit technique to meet individual differences with particular emphasis on the superior pupil. The program, comprising class and laboratory hours, is flexible as far as laboratory hours are concerned. Teachers who complete their teaching responsibilities a week after the course begins may still enroll in the workshop by attending the daily group meetings of the class from 4-6 p.m. during the first week. Any laboratory periods not attended during the first week may be made up during the second and third weeks of the workshop. Credit 3

3 weeks, June 10-29.

1st week: class hours 4-6 p.m.; laboratory 9-11 a.m., or 2-4 p.m.

2nd and 3rd weeks: class hours 10-12 a.m.; laboratory 8-10 a.m., or 2-4 p.m.

Machmer E32, E34 Mrs. Trumbull, Mr. Fennell, and consultants from State Department of Education, other School Systems and Schools of Education.

Workshop in American Studies

ENGLISH 87, 187. Problems in American Literary and Linguistics Studies. An exploration of problems connected with the teaching of American language and literature in the context of American culture. Credit 3

3 weeks, June 17-July 5 Mr. Lloyd

9 - 10:30 and 1:30 - 3, MTWTF, Old Chapel B

ENGLISH 90, 190. The United States, 1920-1940. An interdepartmental approach to the study of major developments in American life during the two decades after World War I. Credit 3
3 weeks, June 17-July 5 Mr. Schendler and Mr. Mann
9 - 10:30 and 1:30 - 3 MTWTF, Old Chapel C

School of Engineering

CHEMICAL ENGINEERING 75. Instrumentation. A detailed study of the underlying principles and practices of indicating, recording and controlling instruments used on industrial process equipment. Credit 3
Three 40-hour weeks: Aug. 26-Sept. 13 Mr. Lindsey and Mr. Duus
Engineering Annex
Prerequisites, Physics 27, 28; Chemical Engineering 55, Calculations

CHEMICAL ENGINEERING 88. Chemical Engineering Laboratory. A quantitative study of pilot plant size equipment illustrating some unit operations. Credit 3
Three 40-hour weeks: June 3-21 Mr. Cashin and Mr. Goodchild
Engineering Annex
Prerequisite, Chemical Engineering 56, Unit Operations II

CIVIL ENGINEERING 27. Plane Surveying. The basic principles of mensuration; use of tape, transit, and level; a brief consideration of route surveying for forestry majors. Credit 3
Three 40-hour weeks: July 15-Aug. 2; July 29-Aug. 16; Aug. 19-Sept. 6
Engineering Building Mr. Boyer, Mr. Grow
Prerequisites, Mathematics 5, Introductory Engineering Mathematics, or Mathematics 7, Algebra and Trigonometry

CIVIL ENGINEERING 28. Property and Topographic Surveying. A transit and tape property survey requiring reference to Registry of Deeds records; also a topographical survey. Credit 3
Three 40-hour weeks: June 3-21; June 24-July 12. Mr. Hendrickson
Engineering Building
Prerequisite, Civil Engineering 25, Surveying or Civil Engineering 27, Plane Surveying.

CIVIL ENGINEERING 30. Route Surveying Practice. A preliminary survey for a short highway location and the preparation of maps and profile.
Three 40-hour weeks: June 3-21, June 24-July 12. Credit 3
Engineering Building Mr. Grow, Mr. Boyer
Prerequisite, Civil Engineering 25 or 27

MECHANICAL ENGINEERING 23. Shop. Welding and machine shop, use of various machine and hand tools used in metal working. Credit 3
Three 40-hour weeks: July 29-Aug. 16; Aug. 19-Sept. 6
Engineering Shop Mr. Patterson, Mr. Costa

MECHANICAL ENGINEERING 27. Shop. Welding, manual and automatic. For mechanical engineering majors. Credit 3
Three 40-hour weeks: June 3-21; June 24-July 12. Mr. Patterson, Mr. Spencer
Engineering Shop

MECHANICAL ENGINEERING 28. Machine Shop. The fundamental machine tools; lathe, planer, shaper, milling machine and drill press. Credit 3
Three 40-hour weeks: June 3-21; June 24-July 12. Mr. Hopkins, Mr. Costa
Engineering Shop

Department of Forestry and Wildlife Management

FORESTRY 55, 155. The Elements of Forest Mensuration. Methods of determining the volume and value of the forest growing stock; type mapping; methods of predicting growth of trees and stands. Credit 3
Three 44-hour weeks: June 3-22 Mr. MacConnell, Mr. Bond
Conservation Building

FORESTRY 78. Harvesting of Forest Products. Practice in the harvesting and preparation of direct forest products. Field trips to active forest properties and to visit pulpwood operations and manufacturing plants. Credit 3
Three 44-hour weeks: June 24-July 13 Mr. Bond, Mr. MacConnell
Conservation Building

Department of Physical Education for Men

PHYSICAL EDUCATION 80, 180. Driver Education and Driver Training. Objectives, scope, content, and problems of driver training; teaching materials; psycho-physical tests; motor vehicle construction, operation, and maintenance; advanced driving practices; administrative standards; practice teaching and behind-the-wheel instruction. Offered in cooperation with the Center for Safety Education, New York University, and the Massachusetts Registry of Motor Vehicles. Credit 2
8 - 12 MTWTF June 24-July 5. Mr. Stack and Staff
Curry Hicks Gymnasium

School of Nursing

(Continuing courses with registration restricted to full-time students enrolled in the basic collegiate nursing program at the University of Massachusetts School of Nursing.)

NURSING 27S. Fundamentals of Nursing. This course introduces the students to the nursing care of the patient in the hospital. Emphasis is placed upon the fundamentals of nursing care for all patients and the relationship of the nurse to agencies and personnel providing individual, family and community health services. Credit 9
June 10-August 2 at Springfield Hospital Miss Gilmore
Prerequisite, Nursing 26

NURSING 28S. Social and Historical Foundations of Nursing. A survey course of nursing history from the pre-Christian era to the present. The influence of society upon nursing in the various historical periods is considered in relation to the development of nursing as a profession. Credit 2
June 10-August 2 at Springfield Hospital Miss Maher
Prerequisite, Nursing 26

CHILD STUDY 290S. The Teaching and Learning Process in the Early Years. The course is designed to give the students an increased understanding of the continuing influence of the family on the growing child and the influence of the developing child on his parents and siblings. Through observation and participation in the care of children (2-12 years of age), case studies, and group discussion, the student gains an appreciation of variations in normal growth and development and parent-child relationships. Credit 4
Vassar Summer Institute for Family & Community Living
Poughkeepsie, New York Professional Staff of the Vassar Summer Institute

NURSING 57S. Maternity Nursing I. Unit I of the course in Maternity Nursing is developed around the meaning of pregnancy to the patient and the family with special emphasis on the mother's physiological and psychological needs, before, during and after the birth of the child. Some specialized skills in maternity nursing are taught in relation to an understanding and appreciation of the phenomena of pregnancy and the birth process, the immediate care of mother and infant, newborn care, the importance for early constructive mother-child relationships, and the need for patient teaching.
August 1-30 at Wesson Maternity Hospital, Springfield Credit 3
Prerequisites, Nursing 26, 27S, 51 Miss Ostrander, Miss DiMaggio

NURSING 60C. An extension of the courses in Medical and Surgical Nursing focused on the care of patients with special health problems. Credit 2
August 5-30 at Springfield Hospital Miss .....
Hours to be arranged

Work-Conferences for Graduate Nurses

Three job-related work-conferences will be given June 10 to June 15 (inclusive) for graduate professional nurses.

NURSING 52 (G.N.) Nursing Services for the School Age Child. A one-week work-conference designed to provide a means whereby nurses, giving direct services to the child in school, may consider newer trends in school health practice, and the expanding role of the nurse in these school health services. Credit 2
MTWTFS 9:00 - 12:00 and 1:00 - 4:00 p.m., Engineering Building
Miss Rita Murphy, Educational Director, Rhode Island State Department of Public Health

NURSING 73 (G.N.) Curriculum Reorganization in Basic Schools of Nursing. A one-week work-conference for educational directors and instructors in basic schools of nursing who wish to study ways and means of solving selected common curriculum problems and improving educational programs. Credit 2
MTWTFS 9:00 - 12:00 and 1:00 - 4:00 p.m., Engineering Building
Miss Macdonald

NURSING 70 (G.N.) Management of Nursing Services. A one-week work-conference designed to provide a means whereby nurses responsible for nursing services, may consider the basic concepts of good management, and the utilization of nursing resources. Credit 2
MTWTFS 9:00 - 12:00 and 1:00 - 4:00 p.m., Engineering Building
Miss Newcomb

UNIVERSITY OF MASSACHUSETTS SUMMER SCHOOL APPLICATION

Prospective students (except those enrolled at the University during the spring semester) should send this application to the Registrar, University of Massachusetts, as soon as possible. In this way admission to courses with limited enrollment can be assured. Regularly enrolled students at the University will secure a special application form at the Registrar's Office.

Name Mr. / Mrs. / Miss .....
Last First Middle

Home address.....
Street and number

.....
City State

Indicate educational institutions above secondary school level that you have attended .....

.....

What degrees and where earned.....

If you are now enrolled at another college, have the following statement completed by your Registrar (a transcript of record is not required):

This is to certify that ..... is in good standing
Student's name

at ..... and has our approval to take the courses
Name of college

listed on this application.

Signed.....

Will you be studying under the G. I. Bill? .....

Will you require a dormitory room? .....

Will you commute from home? .....

Tentative Program

A normal program consists of one course during the Pre-session and two courses during the main (six-week) session. An additional course can be approved only in case the student's academic record is high. (See page 4 under heading, Amount of Work Permitted.)

List the courses for which you wish to be registered.

Courses: Name and number Descriptive title

.....

.....

UNIVERSITY
of
MASSACHUSETTS
at Amherst

Catalogue of the University
1957-1958

FOREWORD

This Catalogue of the University presents announcements concerning courses, admission, etc., for the sessions of 1957-58.

The University reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

VOLUME XLIX MARCH, 1957 NUMBER 2

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PUBLICATION OF THIS DOCUMENT APPROVED BY
GEORGE J. CRONIN, STATE PURCHASING AGENT

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CALENDAR

1957

January

28-29 — Monday and Tuesday. Registration of all students.
30 — Wednesday, 8 a.m. Classes begin.

February

22 — Friday. Washington's Birthday. No University exercises.

March

20 — Wednesday, 5 p.m. to March 25, Monday, 8 a.m. Spring recess.

April

19 — Friday, Patriots' Day to April 22, Tuesday, 8 a.m. Easter recess.

May

18 — Saturday, 12 noon. Classes stop.
20 — Monday, through May 29, Wednesday. Examinations.
30 — Thursday. Memorial Day. No University exercises.
31 — Friday, through June 2, Sunday. Commencement.

September

6 — Friday, through Sept. 10, Tuesday. Freshman orientation.
9 — Monday, through Sept. 10, Tuesday. Registration of all students.
11 — Wednesday, 8 a.m. Classes begin.

October

12 — Saturday. Columbus Day. No University exercises.

November

11 — Monday. Veterans' Day. No University exercises.
26 — Tuesday, 5 p.m. to December 2, Monday, 8 a.m. Thanksgiving recess.

December

18 — Wednesday, 5 p.m. to January 2, Thursday, 8 a.m. Christmas recess.

1958

January

11 — Saturday, 12 noon. Classes stop.
13 — Monday, through January 21, Tuesday. Examinations.
27-28 — Monday and Tuesday. Registration.
29 — Wednesday, 8 a.m. Classes begin.

February

22 — Saturday. Washington's Birthday. No University exercises.

March

29 — Saturday, 12 noon to April 8, Tuesday, 8 a.m. Spring recess.

April

19 — Saturday. Patriots' Day. No University exercises.

May

20 — Tuesday, 5 p.m. Classes stop.
22 — Thursday, through May 29, Thursday. Examinations.
30 — Friday. Memorial Day. No University exercises.
30 — Friday, through June 1, Sunday. Commencement.

Correspondence regarding various phases of the University program should be directed as follows:

Admission and registration
MARSHALL O. LANPHEAR, *Registrar*

Fees, expenses, payments
AVERY BARRETT, *Cashier*

Loans
EMORY GRAYSON, *Director of Placement*

Scholarships
FRED JEFFREY, *Director*
Stockbridge School of Agriculture

Student housing
HERBERT RANDOLPH, *Housing Supervisor*

Student employment
EMORY E. GRAYSON, *Director of Placement*
CAROL BURR CORNISH, *Placement Officer for Women*

Veterans' Affairs
GEORGE EMERY, *Veterans Coordinator*

Short Courses
FRED JEFFREY, *Director of Short Courses*

Stockbridge School of Agriculture
FRED JEFFREY, *Director*
Stockbridge School of Agriculture

Graduate School
GILBERT WOODSIDE, *Dean of the Graduate School*

Summer Session
SHANNON MCCUNE, *Provost*

Transcript of records
MARSHALL O. LANPHEAR, *Registrar*

Extra-curricular activities
WILLIAM D. SCOTT, *Director, Student Union*

General academic problems
SHANNON MCCUNE, *Provost*

Women's affairs
MISS HELEN CURTIS, *Dean of Women*

UNDERGRADUATE MAJORS

College of Arts and Science

- Bacteriology
- Botany
- Chemistry
- Economics
- English
- Entomology
- Geology and Mineralogy
- German
- Government
- History
- Mathematics
- Music
- Philosophy
- Physics
- Pre-Dental
- Pre-Medical
- Pre-Veterinary
- Public Health
- Psychology
- Recreation Leadership
- Romance Languages
- Sociology
- Speech
- Zoology

College of Agriculture

- Agricultural Economics and Farm Management
- Agronomy
- Agrostology
- Animal Husbandry
- Dairy and Animal Science
- Floriculture
- Food Management
- Food Technology and Fisheries Technology
- Forestry
- Landscape Architecture
- Ornamental Horticulture
- Olericulture
- Pomology
- Poultry Husbandry
- Wildlife Management

School of Business Administration

- General Business Management
- Accounting
- Finance
- Industrial Administration
- Management Training
- Marketing
- Merchandising

School of Education

- Education

School of Engineering

- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Industrial Engineering
- Mechanical Engineering

School of Home Economics

- Child Development and Family Life Education
- Foods, Nutrition and Institution Management
- Pre-research in Nutrition
- Home Economics Education and Extension
- Merchandising and Retailing

School of Nursing

- General Nursing

Division of Physical Education

- Physical Education for Men

BOARD OF TRUSTEES

Ernest Hoftyzer, b.s. (Ohio State University), Wellesley 1957

Alden Chase Brett, b.s., ll.d. (University of Massachusetts), Belmont 1957

Mrs. Elizabeth Laura McNamara (Graduate of Teacher's College), Cambridge 1958

Lewis Perry, b.a., l.h.d. (Williams College), m.a. (Princeton University, Yale University), litt.d. (Dartmouth College), l.h.d. (Amherst College, University of New Hampshire), ll.d. (Harvard University), Boston 1958

Dennis Michael Crowley, b.s., m.s. (University of Massachusetts), ll.b. (Boston College), Boston 1959

Francis Roland McDermott, a.b. (College of the Holy Cross), Wrentham 1959

Frank Learoyd Boyden, a.b., a.m. (Amherst College), a.m. (Williams College, Yale University), sc.d. (Colgate University), ph.d. (New York State College for Teachers), ll.d. (Wesleyan University, Bowdoin College, Kenyon College, Harvard University), l.h.d. (Amherst College, Williams College, Princeton University), litt.d. (Tufts College), Deerfield 1960

Ralph Fred Taber, b.s. (University of Massachusetts), a.m. (Harvard University), West Newton 1960

Harry Dunlap Brown, b.s. (University of Massachusetts), Billerica 1961

John William Haigis, Jr., b.a. (Amherst College), Greenfield 1961

Joseph Warren Bartlett, a.b. (Dartmouth College), ll.b. (Harvard University), ll.d. (University of Massachusetts), Boston 1962

Philip Ferry Whitmore, b.s. (University of Massachusetts), Sunderland 1962

William Michael Cashin, a.b. (Boston College), Milton 1963

TRUSTEES

Miss Grace A. Buxton, A.B. (Smith College), LL.B. (Northeastern University), Worcester 1963

Members Ex Officio

His Excellency Foster Furcolo, B.A., LL.B. (Yale University), Boston, *Governor of the Commonwealth.*

Jean Paul Mather, B.S.C., M.B.A. (University of Denver), M.A. (Princeton University), LL.D. (American International College, Amherst College), D.Sc. (Lowell Technological Institute), Amherst, *President of the University.*

John Joseph Desmond, Jr., A.B., A.M. (Harvard University), D.Ed. (Suffolk University), Boston, *Commissioner of Education.*

L. Roy Hawes, Boston, *Commissioner of Agriculture.*

Officers of the Board

His Excellency Foster Furcolo, B.A., LL.B. (Yale University), Boston, *Governor of the Commonwealth.*

Joseph Warren Bartlett, A.B. (Dartmouth College), LL.B. (Harvard University), LL.D. (University of Massachusetts), Boston, *Chairman.*

James William Burke, B.S. (University of Massachusetts), Amherst, *Secretary.*

Kenneth William Johnson, B.S. (University of Vermont), Amherst, *Treasurer.*

OFFICERS OF ADMINISTRATION

President Jean Paul Mather	South College
Provost Shannon McCune	South College
Secretary James William Burke	South College
Treasurer Kenneth William Johnson	South College
Dean of Men Robert Stoddart Hopkins, Jr.	South College
Dean of Women Helen Curtis	South College
Registrar Marshall Olin Lanphear	South College
Dean of Graduate School Gilbert Llewellyn Woodside	Fernald Hall
Director of Experiment Station Dale Harold Sieling	Stockbridge Hall
Director of Extension Service James Wilson Dayton	Stockbridge Hall
Director of Stockbridge School Fred Painter Jeffrey	Stockbridge Hall
Librarian Hugh Montgomery	Goodell Library
Business Manager Hobart Hayes Ludden	South College
Director of Publications Robert Joseph McCartney	South College
Senior Physician Ernest James Radcliffe	Out Patient Department
Director of Placement Emory Ellsworth Grayson	South College
Alumni Secretary Robert Leavitt	Memorial Hall
Student Union Director William David Scott	Student Union

GENERAL INFORMATION

The University of Massachusetts is the state university of the Commonwealth, founded under provisions of the Morrill Land Grant Act of Congress of 1862.

Location

The University of Massachusetts is located near the geographical center of the state at Amherst. This town of about 7,000 overlooks one of the most picturesque sections of the Connecticut River Valley. The valley is noted both for its scenic beauty and its educational institutions. The setting for the University, therefore, is ideal. The surrounding country is a rich agricultural region providing an excellent outdoor laboratory for the work in Agriculture and Horticulture as well as for the Biological Sciences and Geology. Those interested in other Sciences and Liberal Arts study under equally favorable conditions both because of the facilities at the University and its location in this educational area of the valley.

The Trustees of Massachusetts Agricultural College were incorporated in 1863 and officers were appointed in that year. It was not until October 2, 1867, however, that the College was formally opened to students. At that time there were four teachers on the faculty and four wooden buildings on the campus. The enrollment steadily increased during the first term, however, and by December, 1867, forty-seven had been admitted. From this modest beginning the College has grown steadily both in number of students and scope of its work. In April, 1931, the name of the institution was changed by legislative enactment to Massachusetts State College. In 1939 the Trustees voted to award the A.B. degree as well as the B.S., which previously had been the undergraduate degree of the College. In May, 1947, the College became the University of Massachusetts.

Amherst is eighty-seven miles from Boston and may be reached by bus connections from Northampton, Greenfield, Springfield, and Worcester. The campus consists of a tract of approximately seven hundred acres, lying about a mile north of the village center. In addition, the University owns one area of 755 acres six miles north of the campus on Mt. Toby and has recently been given another tract of 1200 acres of readily accessible forest land on Mt.

Lincoln several miles to the east of the campus. These holdings are administered by the Department of Forestry and are used in instruction as demonstration forests.

The University also operates a horticultural field station at Waltham and a cranberry field station at East Wareham.

Functions

The University of Massachusetts now serves the Commonwealth in the three important fields of resident instruction, research, and extension. Since all three services are organized on the campus, students have the advantages that come from contact with persons carrying education to the state at large, with others conducting original investigation as well as those engaged in formal instruction.

BRANCHES OF INSTRUCTION

The Undergraduate College

The University offers four-year undergraduate instruction leading to the following degrees: Bachelor of Science, Bachelor of Arts, Bachelor of Science in Chemical, Civil, Electrical and Mechanical Engineering, Bachelor of Business Administration and Bachelor of Vocational Agriculture.

This instruction is assigned to the College of Arts and Science, the College of Agriculture, the Schools of Business Administration, Education, Engineering, Home Economics, Nursing and to the Division of Physical Education. The aim of the four-year course is to give as high a degree of proficiency in some particular branch of learning as is possible without sacrificing the breadth, knowledge, and training which should characterize a well-rounded college education.

The degree of Bachelor of Science is conferred upon those candidates who complete the curriculum requirements of the freshman and sophomore years, and 60 junior-senior credits including the specialization requirements in a particular biological or physical science department of the College of Arts and Science. The Bachelor of Science degree is awarded also to students who complete the curriculum requirements of the College of Agriculture, the Schools of Home Economics and Nursing, and the Division of Physical Education for men. This degree may be granted to students majoring in Education or Psychology who complete a minimum of 15 junior-senior credits in science departments of the College of Arts and Science.

The degree of Bachelor of Arts is awarded to all candidates who complete the curriculum requirements of the freshman and sophomore years in the College of Arts and Science and 60 junior-senior

credits including the specialization requirements of a liberal arts department in the College. This degree may be awarded also to majors in a biological or physical science department who select a minimum of 18 junior-senior credits in liberal arts departments of the College.

All graduates from the School of Engineering will receive the appropriate degrees of Bachelor of Science in Chemical Engineering, Civil Engineering, Electrical Engineering or Mechanical Engineering.

All graduates from the School of Business Administration will receive the degree of Bachelor of Business Administration.

Special arrangements are made for some graduates of county agricultural schools and of agricultural departments of certain high schools to complete the college course with majors in agriculture or horticulture. Upon the completion of their course they will be granted a Bachelor of Vocational Agriculture degree.

The Graduate School

Graduate courses leading to the Doctor of Philosophy degree may be taken in the following fields: Agronomy, Bacteriology, Botany, Chemistry, Economics, Entomology, Food Sciences, Food Technology and Psychology.

The following departments offer major work leading to a Master's degree: Agricultural Economics, Agricultural Engineering, Agronomy, Bacteriology, Botany, Business Administration, Chemistry, Chemical Engineering, Civil Engineering, Dairy and Animal Science, Economics, Education, Electrical Engineering, English, Entomology, Floriculture, Food Technology, Geology and Mineralogy, History, Home Economics, Landscape Architecture, Mathematics, Mechanical Engineering, Olericulture, Philosophy, Pomology, Poultry Science, Psychology, Public Health, Romance Languages, Sociology, Wildlife Management, Zoology.

The degree of Master of Landscape Architecture is granted to students completing the two years' graduate work offered by the Department of Landscape Architecture; while students taking the equivalent of one year's graduate work in that major may be granted the degree of Bachelor of Landscape Architecture.

Several other departments in the University, while not regularly organized for major work in the Graduate School, do, nevertheless, offer courses which may be selected for minor credit. These are: Forestry, German, Government, Physical Education for Men, Physics, and Veterinary Science.

The general requirements of the Graduate School regarding admission, residence, credits, tuition, etc., together with specific information concerning details of interest to prospective students,

are outlined in a separate bulletin, which may be obtained upon request from the Dean of the Graduate School.

The School of Business Administration offers, through the Graduate School of the University, a program of advanced study in Business leading to the degree of Master of Business Administration.

The Summer School

A Summer Session is available for those desiring to accelerate their program. This Summer Session is planned to serve the needs of (1) all students enrolled as candidates for a degree at any college, (2) persons desiring refresher or professional improvement courses, (3) graduate students desirous of meeting specific requirements in certain fields, and (4) any adult person who finds courses suited to his preparation and needs. Applications for the Summer School may be obtained by writing to the Director of the Summer Session.

The Stockbridge School of Agriculture

The University, through its Short Course division, as a special service under the Land-Grant Act by which it was established, provides a complete non-degree program of two-year technical and vocational courses in the fields of agriculture and horticulture.

This School was organized at the University in 1918 under the name of "The Two Year Course in Practical Agriculture." Its purpose was to meet the demand for shorter courses in agriculture which might be taken by high school graduates who could not satisfy college entrance requirements or who, for one reason or another, were unable to take the four year college course. In 1928 the School was given its present name in honor of Levi Stockbridge, first professor of agriculture at the University and its fifth president.

This program trains men and women primarily for the practice of farming or associated agricultural industries. A diploma is awarded for satisfactory completion of the course.

As the two-year program is now organized a student may choose any one of eleven vocational courses including dairy farming, dairy manufactures or milk plant operation; poultry farming, arboriculture or the care of trees; fine turf maintenance for golf courses, cemeteries, park, and play-grounds; commercial flower growing, both retail and wholesale; food management for clubs, hotels, and restaurants; commercial fruit farming, ornamental horticulture or landscape gardening; commercial vegetable farming, and applied forestry for timber growing and forest products industries.

On-the-job placement training is required of all first year students in the second semester for a period of four to seven months, depending on type of employment. No student can earn a diploma of graduation without this applied training experience. Wages earned can pay a large part of second year expenses if the student is forced to economize.

Limited enrollment quotas in each major course make necessary early filing of application. No formal entrance examinations are required for non-degree short courses.

A catalogue, giving complete description of all two-year courses offered in The Stockbridge School of Agriculture, as well as full details on estimated costs, employment opportunities in each field, and entrance arrangements is available. Application form is printed in the catalogue. Write to Director of Short Courses, University of Massachusetts, Amherst.

NOTE: (For interview or personal conference the Short Course Office is open Monday through Friday from 8:30 to 12:00 and 1:00 to 5:00, state and national holidays excepted.)

Other Non-Degree Short Courses

Other short courses, varying in length from one to ten weeks, furnish supplementary training for city and town sanitary inspectors, tree wardens and city foresters, golf course greenkeepers, and skilled workers in dairy and ice cream plants. A certificate is presented upon the satisfactory completion of the course.

Research and Regulatory Services

The University of Massachusetts serves the fields of agriculture and horticulture through its Experiment Station, which provides research and regulatory services. Experiment stations were established in all states as the need of development of practical information on subjects relating to agriculture became apparent. Through the efforts of experiment stations a fund of scientific knowledge applicable to agriculture and horticulture has been accumulated, and research workers in the experiment stations continue to contribute to this knowledge by constant research and experimentation.

At the University of Massachusetts, the Experiment Station service has expanded until it now deals with problems in the following fields of specialization: Agricultural Economics and Farm Management, Agronomy, Animal Husbandry, Bacteriology, Botany, Chemistry, Dairy Industry, Economics, Engineering, Entomology, Horticulture, Floriculture, Food Technology, Nutrition,

Olericulture, Pomology, Poultry Science, and Veterinary Science. Most of the research activities of the University of Massachusetts are undertaken at the main Experiment Station at Amherst. There are, however, two substations, one at Waltham, devoted largely to the problems of horticulture as applied to olericulture, floriculture, and nursery culture, and one at East Wareham, where attempts are in progress to solve the problems of the cranberry and blueberry growers.

In addition to the work described above, the administration of certain regulatory services, as pertaining to the sale of feeds, fertilizers, and seeds and to the use of dairy glassware, is also assigned to the Experiment Station which is equipped with the necessary laboratory facilities and personnel for that purpose.

Extension Service

The Massachusetts Extension Service is a cooperative teaching effort between the United States Department of Agriculture, the University of Massachusetts and the several counties of the State. The work of the Extension Service is carried on through unified teaching programs in all parts of Massachusetts. The Extension Service assists the people of the farm, the home, and the rural communities to improve agriculture, home making, and rural life. The University of Massachusetts is the State Extension Service headquarters. Extension educational teaching plans are made in council with the people who determine their problems and help to suggest methods and practices for their solution.

The Extension effort was brought about by the Smith-Lever Law, passed by Congress on May 8, 1914. Since that time, the service has grown to a staff of over 100 State and County workers who conduct an educational program in all phases of agriculture and homemaking among the adults and young people (4-H Club work) of the State. All types of methods, including subject matter, meetings, demonstrations, farm and home visits, publications, visual aid, and radio are used in carrying out this educational program directly in the farm and rural areas of the State. During the war emergency, the Extension Service extended its home food production and preservation program to the urban areas.

ADMISSION

Persons interested in applying for admission to the University of Massachusetts should write to the Registrar to obtain an application form. The first two pages of the application form are completed by the candidate himself. The last two are completed by high school or preparatory school authorities who mail the application form directly to the Registrar of the University.

Because of the increasing interest in college level study and the consequent increase in the number of applications, candidates are advised to file their applications early in the senior year of high school and certainly not later than March 1 of the year in which they plan to enter.

Candidates for the freshman class are accepted only for the opening of the college year in September. Students enrolled in other colleges may apply for admission to the Summer Session, but admission to the Summer Session does not necessarily constitute regular admission and enrollment in the undergraduate program of the University.

The University admits young men and women to the freshman class chiefly on the basis of character and scholarship. The general record must indicate promise of success and ability to profit by the opportunities which the University has to offer. Due regard is given to special achievement in specified subject matter fields.

Methods

Plan A. Students applying from accredited schools and making the college recommendation grade of their school in accordance with the subject requirements listed above are considered certified for admission.

Superior graduates of Vocational Schools of Agriculture in Massachusetts and Vocational Agricultural Departments in Massachusetts High Schools may be accepted for the Degree of Bachelor of Vocational Agriculture provided:

a. They are unqualifiedly recommended by the Vocational Division of the Department of Education as bona fide Vocational Graduates with superior ranks; and

b. That they can present at least 16 units of certified entrance credits, approved as to quality and quantity by the State Department of Vocational Education.

Plan B. Students who are not fully certified will be required to take the Scholastic Aptitude Test of the College Entrance Examination Board. In some cases three Achievement Tests will be required also. The applicant will be informed what tests are to be taken as soon as his application is received or at the time of his personal interview. Candidates will ordinarily take these examinations in the spring of their senior year. Application blanks and a bulletin of general information concerning the tests may be obtained from the College Entrance Examination Board, P. O. Box 592, Princeton, New Jersey.

The University realizes that though almost all students will qualify under either Plan A or B, there will be a few promising candidates who, for one reason or another, are unable to meet fully the subject requirements for enrollment. Such applicants are requested to present their individual problems to the Registrar in order that the Admissions Committee may outline for them what must be done to qualify for enrollment.

Advanced Standing

A limited number of students from approved colleges may be admitted on transfer to advanced standing. Since applicants for such admission usually exceed the number that can be accepted, they are placed on a competitive basis. Acceptance will thus depend upon recommendations and quality of record.

Candidates desiring to transfer to the University of Massachusetts from other institutions should write to the Registrar for a regular application form, inasmuch as a student applying for transfer must first of all be able to meet the entrance requirements of the University. Such candidates should also submit the following:

a. A letter outlining reasons for wishing to transfer and describing briefly the type of major work to be followed if accepted for admission.

b. An official transcript of entrance credits and college record to be sent by the Registrar of the College from which he wishes to transfer. This should be forwarded as soon as possible after the close of the semester preceding the one for which transfer is sought.

At least forty-five semester hours of work in residence are required of any transfer student desiring to be recommended for the Bachelor's degree.

Subject Requirements

The subjects of preparatory study required for admission call for the satisfactory completion of a four-year high school course

or its equivalent and are stated in terms of units. A unit is the equivalent of at least four recitations a week for a school year. High school graduation alone is not sufficient. The applicant's record must indicate capacity for handling the quality of scholastic work which the University has established as its standard of achievement.

Sixteen units of secondary school work must be offered, selected according to the following requirements:

Algebra	1½
Plane Geometry	1
English	4
Foreign Language (2 years of 1 language)	2
U.S. History	1

The remaining units are elective and may be selected from the following subject matter:

a. Mathematics
b. Science
c. Foreign Language
d. History and Social Studies
e. Free electives (not more than four units)

Free elective subjects are those not included in groups a-d, as for example: Music, Art, Drawing, Typewriting, Aeronautics, Agriculture, Home Economics, etc. Such free electives are allowed in order that the student who wishes may have some opportunity to elect other high school offerings, while at the same time covering the fundamental requirements for college work.

Students planning to pursue an engineering curriculum should offer two years of Algebra, one of Plane Geometry, and one-half year each of Trigonometry and Solid Geometry, Chemistry and Physics are also advised. Those deficient in the Mathematics should plan to cover it during the summer prior to entrance or expect to take five years to complete the college course.

In high schools organizing agricultural club work under the supervision and rules of the Junior Extension Service of the University, one credit is granted for each full year of work approved by the State Leaders.

Candidates of exceptional ability and promise may be considered for admission even though some of the prescribed courses were not included in their high school program.

Physical Examination

Physical examination by their local doctor is required of all entering freshmen, re-entering students and all students participating in athletics. Physical report forms for this examination will be

mailed to each student with the bill for the first semester and must be completed and returned to the University Health Service 10 days before the opening of the semester. Evidence of a *successful* smallpox vaccination is required.

Veterans' Affairs

The Veterans' Coordinator is a member of the Placement Service.

Veterans enrolling for the first time under Public Law 346 must file a Certificate of Eligibility with the Placement Office prior to or at registration. All veterans should clear their affairs through the Placement Service.

EXPENSES

The sections of the catalogue that follow are primarily for undergraduate students in the four year degree course. Those interested in graduate study are referred to the Graduate School catalogue and in short courses to the catalogue of the Stockbridge School of Agriculture and other short course publications.

University Fees

Expenses vary from approximately $860 to $900 per year for the normally economical student. First year costs are usually greater than those of the other three years and there is less opportunity to earn. A student is advised to have a definite plan for meeting the expenses of the first year before entering.

Freshmen entering the School of Engineering should be prepared to meet an expense of approximately $35 for drawing equipment and a slide rule.

The following estimate of a year's expenses, based upon last year's costs, includes only those items which are strictly college and does not include amounts for clothing, laundry, travel, etc. These costs vary slightly from year to year. Tuition for residents of Massachusetts is $100 per year and for others $400.

	Normal
Tuition (citizens of Massachusetts)	$100.00
Room in college dormitory or private home (average)	180.00
Board at University Dining Hall	430.00
Books, stationery, and other supplies	100.00
Athletic Fee	20.00
Student Tax (approximate)	38.50
Student Union Fee	20.00
	$888.50

Initial Payment for Freshmen

The initial payment required of freshmen at the time of fall registration is indicated below and is made up of the following items:

Tuition (citizens of Massachusetts)	$50.00
Room rent (dormitory) approximately	90.00
Board (University Dining Hall)	165.00
Military Uniform (men students)	30.00

Physical Education Equipment Fee (men only)	10.00
Athletic Fee	20.00
Student Tax (approximate)	20.00
Books, Stationery, etc.	60.00
Student Union Fee	10.00
	$455.00

The above are only approximate figures. A bill will be rendered to the parent of each student prior to the opening of the University.

Tuition

As a state institution the University of Massachusetts offers a low rate of tuition to all students entering from the Commonwealth. Eligibility for admission under the low residential rate is determined in accordance with the following policy established by the Board of Trustees.

A student must present evidence satisfactory to the Treasurer of the University that his domicile is in the Commonwealth of Massachusetts in order to be considered eligible to register in the University as a resident student. This means that he must have established a *bona fide* residence in the Commonwealth with the intention of continuing to maintain it as such.

The domicile of a minor shall follow that of the parents unless such minor has been emancipated. In case of emancipation the student, in addition to the requirements of these regulations, respecting residence, shall present satisfactory proof respecting emancipation. Minors under guardianship shall be required to present, in addition to the certification of the domicile of the guardian, satisfactory documentary evidence of the appointment of the guardian.

No student shall be considered to have gained residence by reason of his attendance in the University nor shall a student lose residential preference during his continuous attendance at the University.

The residence of a wife shall follow that of the husband.

The prescribed form of application for classification as to residence status must be executed by each student. Misrepresentation of facts in order to evade the payment of out-of-state tuition shall be considered sufficient cause for suspension or permanent exclusion from the University.

Discretion to adjust individual cases within the spirit of these rules is lodged with the President of the University.

Board

The University provides three dining halls for students at Butterfield House, Greenough House and University Dining Commons. The dining halls at Butterfield and Greenough dormitories are intended primarily to provide for students housed in that area, including residents of Chadbourne, Mills and Brooks Houses.

All freshmen, sophomores and juniors residing in University Dormitories will be required to board at University Dining Halls, except that such students who are members of fraternities or sororities are permitted to board at their respective fraternities or sororities.

Any student who wishes may board at University dining halls on the ticket plan or cash basis.

Military Uniform

All freshmen students taking military drill are required to make a deposit of $30 for the uniform at the time the first semester bill is paid. Charges for loss or damage of the government issued uniforms will be deducted from this deposit. Should the amount on deposit drop below $20, because of charges, the student will be required to make additional deposit to restore the balance to $30. The deposit will be refunded to the student less any charges after clearance from the Air Force or the Army after the student has completed the requirements of the basic course, has been excused from the course or has left the University.

Student Activity Tax

This tax, authorized by vote of the undergraduate students with the approval of the Board of Trustees, provides each student with the *Collegian,* the student newspaper; *Index,* University annual; Social Union privileges, student government, class and other activities.

PAYMENTS

Advanced Payment

New students will be expected to make an advance payment of $15 to the Treasurer of the University as soon as they are notified by the Registrar that they are accepted for admission. This will be considered as first payment on registration fee, which will be due at time of matriculation in September. It is not refundable and will be considered as payment for admissions and registration expense if the student does not matriculate.

A Certificate of Residence form furnished by the University must be properly filled out by the parent and the town or city clerk and returned with the $15 advance payment.

When Payments Are Due

In accordance with policy established by the Board of Trustees, all charges for tuition, fees, board, and room rent in University Dormitories are due and payable seven days prior to the date of registration of each semester. Bills will be rendered in advance and payment may best be made by mail. Students may not register until registration charges are paid.

Late Payment and Registration

Any student who does not make payment of his semester charges within the time specified may be required to pay a fine of $5.00. Similarly, any student who does not report for registration on the dates specified or fails to complete his registration within the prescribed time may be required to pay a late registration fee of $5.00.

Tuition and Fee Refunds

A student who leaves the University for any reason except as specified below before a semester is completed will be granted a refund of tuition and fees in accordance with the following schedule:

Regular Term

a. Within the first two weeks from the beginning of semester or term — 80%
b. During the third week — 60%
c. During the fourth week — 40%
d. During the fifth week — 20%
e. After the fifth week — no refund

Six-Week Summer Session

a. During the first week — 60%
b. During the second week — 20%
c. After the second week — no refund

A student who makes an advance payment and then for any reason does not attend any part of the next semester or term at the University will be given a full refund of tuition and fees. The $15.00 advance payment fee required of new students is not refundable.

A student who is involuntarily called into military service before the completion of a semester will be given a pro rata refund of tuition and fees provided that he receives no academic credit for the work of that semester. If academic credit is given, there will be no refund.

A student who is suspended or expelled from the University for disciplinary reasons forfeits all rights to a refund.

Room Rent Refunds

It is the policy of the University that there will be no refund of prepaid room rent after the semester has commenced except in the case of a student who is involuntarily called to military service who will be granted a refund on a pro rata basis.

A student who has made an advance payment of room rent who fails to attend any part of the next semester or term or does not reside in a dormitory or other housing will be granted a full refund of prepaid room rent.

Board Refunds

Prepaid board will be refunded on a pro rata basis.

Veterans' Information

Veterans who are entering the University for the first time under the old G.I. Bill (P.L. 346) must present a Certificate of Eligibility at registration. This may be obtained from your nearest Veterans Administration office. Veterans failing to obtain the Certificate of Eligibility must make payment of tuition and fees in order to register. Board and room fees must be paid in advance whether enrolled under the G.I. Bill or not.

Veterans (under P.L. 346) who are transferring to the University of Massachusetts from another institution or who have done summer work at another institution will be required to submit a supplemental Certificate of Eligibility at registration. This may be obtained by applying through the veterans' office at the institution last attended.

Veterans entering under the new G.I. Bill (P.L. 550) must meet all expenses personally. Presentation of a Certificate of Eligibility should insure the receipt of subsistence checks from the Veterans Administration.

FINANCIAL AID

Scholarships, loans, and part-time employment are available for a limited number of needy and deserving students. See page 36.

Aid for Freshman Year

Freshmen are eligible for scholarships and part-time employment. A freshman also becomes eligible for assistance from loan funds after satisfactorily completing one semester of academic work. Scholarship application blanks may be secured from the Registrar and should be filed by March 15. Part-time employment

application forms may be obtained from the Director of Placement Service and filed after a candidate has been accepted for admission.

Because of the time required for preparation of studies, few students should plan to spend more than ten hours per week in part-time employment.

Aid for Upperclassmen

To become eligible for financial assistance, whether scholarship, loan, or part-time employment, students must file completed financial aid application forms with the Student Aid Committee in the Placement Service office by March 15 previous to the college year for which assistance is asked.

Aid for Graduates of the University

The Lotta M. Crabtree Agricultural Funds make available to graduates of the University of Massachusetts funds to be used for farm financing.

The purpose of loans from these funds is to assist meritorious graduates who are without means in establishing themselves in agricultural pursuits. These loans are made without interest or service charges other than the cost of title search and legal papers. They must, however, be paid back in full amount within a reasonable length of time and there are certain restrictions on their use.

Applications for the "Lotta Agricultural Fund" should be addressed to the Trustees of the Lotta M. Crabtree Estate, 619 Washington Street, Boston, Massachusetts, or may be secured at the Placement Office at the University. Decisions regarding the granting of a loan rest entirely with the Trustees under the terms of Miss Crabtree's will.

UNIVERSITY REGULATIONS

Standards of Deportment

The customary high standard of college men and women in honor, self-respect, and consideration for the rights of others constitutes the ideal of student deportment.

The privileges of the University may be withdrawn from any student at any time if such action is deemed advisable.

It should be understood that the University, acting through its President or any administrative officer designated by him, distinctly reserves the right, not only to suspend or dismiss students, but also to name conditions under which they may remain in the institution.

Hazing in the sense of the punishment or humiliation of students is not permitted.

Registration

Every student must report for registration on the appointed day. All late registrants must pay a $5.00 fine. No student will be admitted to any class until he has completed the prescribed registration procedure. Changes of courses on the registration card shall be made only by the Registrar's Office.

Any student who does not complete his registration, including payment of semester charges, on the regular registration days will be required to pay a fine of $5.00.

No course will be recorded on the permanent records of the University nor will a student receive credit for it, unless such course appears on the registration card for the semester and has been properly countersigned by the instructor.

Freshman Week

All members of the incoming freshman class are required to be in residence on the campus for the period known as Freshman Week. During this period an attempt will be made to orient the student. He will be given psychological and mental tests, and a physical examination. Schedules and section assignments will also be arranged. In addition there will be lectures on student activities, customs, and curricula, and a scheduled meeting with the student's adviser.

GRADING SYSTEM

Graduation from the University involves the elements of both quality and quantity of work. The mere accumulation of credits earned with D grades will not suffice for the degree. In addition to completing the semester hours required for graduation, a student must have made a quality point average of 2.0 or higher.

I. Grades

Grades shall be reported according to the following letter system. No other interpretation of this letter system shall be authorized.

A — Excellent
B — Good
C — Average
D — Passing (but not satisfactory)
F — Failure
Inc — Incomplete

The grade of Incomplete shall be reported.

A. When a portion of the assigned or required class work has not been completed because of necessary absence of the student or other reasons equally satisfactory to the instructor and then only when he considers the work already done to be of passing quality.

B. When because of serious illness or other cause beyond the control of the student, he is unable to take the final examination. In this case an Incomplete is to be given only if the instructor judges that the quality of the student's work is such that by satisfactory performance in the examination he could complete the work of the course with a passing grade. If the student's record is such that he would fail the course regardless of the result of the examination, he is to be given a failure.

A student can obtain credit for an Incomplete only by finishing the work of the course before the end of the fourth week of the next semester in which he is enrolled. A mark of Incomplete will be automatically converted to a failure if the course requirement has not been satisfied by this time. The initiative in arranging for the removal of the Incomplete rests with the student.

II. Quality Points

A. Quality points per semester hour will be assigned as follows: A, 4; B, 3; C, 2; D, 1; F, 0.

B. *Semester Grade Point Average.* To compute the semester grade point average, the total points earned will be divided by the total credits carried. Credits carried are defined as total credits earned and failed. Grade point averages will be recorded to one decimal place. For example, averages from 2.65 to 2.74 will be recorded as 2.7. At the end of the senior year, the cumulative average will be recorded to two decimal places. A student with an Inc. will not have his semester quality point average computed until these marks have been converted to letters except in those cases where obvious dismissal would be involved regardless of the Incomplete.

C. *Cumulative Average.* To compute the cumulative grade point average, the total points earned will be divided by total credits carried. Total credits carried will be the sum of the total credits earned and failed. When a failed course is repeated, only the last grade, credits and points are considered in computing the cumulative average. A course once passed cannot be repeated for a higher grade.

D. In computing grade point averages the following will not be included:
   1. Required Military and Physical Education courses of the freshman and sophomore years.
   2. Courses for which a student does not receive credit toward a college degree (Mathematics or Foreign Language to satisfy an entrance deficiency).

E. Only grades earned at the University will be included in computing the Cumulative Quality Point Average.

F. *Warning.* Any student whose semester quality point average falls below the cumulative quality point average requirement of his class will be warned of his status by the Registrar and informed of the rules governing dismissal. A copy will be sent to his parent.

III. Dismissal

Dismissal from the University for scholastic reasons shall be based upon the following regulations to be administered by the Committee on Admissions and Records. Changes in these regulations may be made by the Educational Policies Council and the University faculty. A student is dismissed from the University as deficient in scholarship:

A. If at the end of the first semester freshman year, he has failed three academic courses with a combined aggregate of eight or more semester hours and has not made a C grade in each of his other academic subjects.

B. If at the end of the second semester freshman year or first semester sophomore year his cumulative quality point average

is less than 1.5. He will not be dismissed, however, if his quality point average for the current semester is such that a continuation of this performance would result in a cumulative quality point average of 1.7 at the end of the second semester sophomore year.

C. If at the end of the second semester sophomore year or any subsequent semester, his cumulative quality point average is less than 1.7. He will not be dismissed, however, if his quality point average for the current semester is such that if continued until he has the equivalent of ten semesters of work, including residence in another college, his cumulative quality point average will be at least 2.0.

D. A transfer student must satisfy the cumulative quality point average of the class to which he is assigned.

E. Any student upon recommendation of the Dean of his School may request reconsideration of his case by the Committee on Admissions and Records.

F. When a student is dismissed for scholastic reasons only, any certificate or transcript issued must contain the statement "Dismissed for scholastic deficiency but otherwise entitled to honorable dismissal."

G. Dismissal involves non-residence on the University campus or in fraternity or sorority residences coming under University supervision.

IV. Honors

A. *University Honors Groups.* At the beginning of each semester a list is posted of those students who, during the previous semester, made a semester grade point average of 3.0 or higher. Three groups are recognized as follows:

First Honors	3.8 or higher
Second Honors	3.4 to 3.7 inclusive
Third Honors	3.0 to 3.3 inclusive

B. *Graduation with Distinction.* High ranking students will be graduated as follows:

Summa Cum Laude—Cumulative average 3.8 or higher.
Magna Cum Laude—Cumulative average 3.4-3.7 inclusive.
Cum Laude—Cumulative average 3.0-3.3 inclusive.

A transfer, to be eligible for consideration for graduation with distinction, must have earned his final 60 semester hours of credit in residence at the University.

V. Changes in Registration—Adding and Dropping Courses

A. No course will be recorded on the permanent records of the University nor will a student receive credit for it unless he has registered for such a course in accordance with established

procedure on a regularly scheduled registration day or unless his registration shall have been made official by the signature of the Registrar. In the latter case a Program Change Card must be signed by the student's Adviser and the Registrar approving the course. No instructor should allow a student to enter his class unless the student was officially enrolled on a regularly scheduled registration day or submits such a Program Change Card authorizing his admission to the class.

A student may not drop a course without the approval of his Adviser and the Registrar on a Program Change Card. A course dropped without this approval will be recorded as a Failure.

B. No new course can be added to a student's program after ten calendar days from the first scheduled day of classes of each semester.

The normal time for dropping a course without a failure will be established and recorded on the official University Calendar by the selection of the nearest practicable date which will allow three weeks from the first scheduled day of classes of each semester. The selection of this date will be the responsibility of the Provost.

C. A course dropped after the date regularly established on the University Calendar will receive a mark of WF (withdrew failing). This grade will be computed in the quality point average. If a student presents a valid reason from his Adviser for dropping a course after the established date together with a statement from his instructor certifying that he is passing, and it is so recorded on a program change card, the course may be dropped with the mark WP (withdrew passing). The WP is not computed in the quality point average.

D. In case of voluntary withdrawal from the University after the mid-semester report the rules for WF and WP will apply to the entire course program of the student.

Change of Major

A student wishing to change his major must get a Program Change Card at the Registrar's Office. This change is to be approved by the head of the Department or School in which he is now majoring and also by his new major adviser. This card, properly indorsed, must be returned to the Registrar's Office before the change receives final approval.

Graduation Requirements

At the beginning of his freshman year each student selects a school or division in which he will carry his major work. One of the fundamental objectives of all programs, however, regardless

of School, is a general cultural education which should be the mark of every college graduate.

With this end in view all candidates for the B.S. or B.A. degree must take certain required courses: English 1, 2, 25, 26; Speech 3 and 4; two social sciences to be selected from Economics 25, Psychology 26, and Sociology 28; and twelve semester hours of science. In addition, at least three hours must be elected from one of the following: History 5, 6, 59, 60, or Government 25.

The requirements in Physical Education must also be satisfied. All physically fit men students must take Military 1, 2, 25, and 26.

Since the work of the first two years is directed toward a broad, general education as a foundation for the more specialized training of juniors and seniors, it follows that the program of studies for all schools is fairly uniform up to the junior year. Because of this, students can readily change from one curriculum to another or even from one school to another as both freshmen and sophomores.

Regardless of major, students who plan to teach should register early, in their freshman year if possible, with the Department of Education, although their work there does not begin until the junior year.

The minimum requirement for graduation is 60 junior-senior credits in addition to the satisfactory completion of the required and elective work of the first two years. Except upon special permission from the Provost or Registrar, no junior or senior shall enroll for more than 17 or less than 14 credits each semester.

During the junior and senior years, each student shall complete not less than 15, and not more than 30 credits in junior-senior courses in the department in which he is specializing.

It is the policy of the University that the final forty-five semester hours of scholastic work be taken in residence. Residence, for this purpose, is defined as a period of continuous enrollment and regular attendance in classes conducted on the campus of the University.

Financial Requirements for Graduation

Diplomas, transcripts of record, and letters of honorable dismissal will be withheld from all students who have not paid all bills and all loans due the University or all legitimate bills for room rent and board due fraternities. All such bills due the University must be paid ten days preceding Commencement. If paid after that date and the student is otherwise eligible, he may graduate the following year.

Transcripts

Two transcripts of a student's record will be furnished without cost. For each additional copy there will be a charge of one dollar.

Student Housing

It is the policy of the Board of Trustees that men and women students shall be housed in campus dormitories and be required to eat at University dining halls unless given permission to commute. Sophomore and upper-class students will also be required to live in University dormitories in so far as accommodations are available. Those who cannot be so housed will be given permission to live in fraternity or sorority houses or in private homes.

Students who are assigned to housing operated by the University, or homes approved by the University, are expected to occupy them for the entire school year and may not be released sooner except as their places are taken by suitable substitutes.

Dormitories will be open for occupancy at 10 a.m. on the day immediately preceding the opening of the University.

Students assigned to dormitory rooms will be responsible for the room rent of the entire semester. Room rent is not refundable.

Rooms are furnished except for necessary bedding and linen and cared for by the students occupying them. Each occupant is held responsible for any damage.

All student property must be removed from the rooms and the key turned in to the Treasurer's Office immediately after final examinations in June. Such property not removed by the owner will be removed by the University and stored at the owner's expense.

Rooms for Women Students.

Dormitory rooms are available for women students at Abigail Adams, Crabtree, Leach, Hamlin, Knowlton and Arnold Houses.

Under the supervision of the Dean of Women, life in each dormitory is directed by a council of student leaders, advised by a full-time Housemother, so that conditions in the residence halls are conducive to study and good living habits. Through the women's branch of the Student Government, the responsibility is put upon each student to live according to her own best standards as well as according to the standards of the group.

Freshman girls will be assigned rooms in the dormitory and will be notified of the assignment prior to the beginning of college.

Near the close of each year, upperclass women will draw numbers to determine the order in which rooms may be chosen for the coming year.

Only students living in their own homes may commute. Upperclass women may apply to the Dean of Women for permission to live in a sorority house, or to earn room and board in a private home.

Rooms for Men Students.

Dormitory rooms are available for male students at Baker, Butterfield, Lewis, Thatcher, Van Meter, Brooks, Mills, Chadbourne, Greenough, Berkshire, Middlesex and Plymouth Houses.

Upperclassmen should make dormitory room reservations at the Housing Office before May 1. Those who cannot be accommodated in dormitories will be given permission to live in fraternities or private homes. Assignment of dormitory rooms will be under the supervision of the Housing Office. Requests for permission to live off campus must be made in writing to the Dean of Men.

Rooms for Married Students.

The University cannot guarantee facilities for married students; however, those married students who can be accommodated will be housed in the University Apartment Units. Assignments are under the direction of the Housing Office and all inquiries should be addressed to that office. Some students may be able to locate rooms or apartments off campus.

The University of Massachusetts reserves the right to change room assignments whenever necessary.

Advisory System

In order that from the day he enrolls the freshman may have some one to whom he may go for consultation and assistance, each student is assigned to a faculty adviser at the time of registration. It is the function of this adviser to help the student in adjusting himself to the work and life of the University. Academic progress reports issued by the Provost's Office are sent to the advisers periodically, and the students are expected to report to their advisers from time to time to discuss their academic standing. The adviser also forwards reports of academic standing to the parents. Both students and parents are encouraged to consult with the adviser whenever there are problems regarding studies or personal adjustments to college life.

At the beginning of the second semester of the freshman year each student will discuss his vocational and specialization plans with his adviser. If he can decide definitely upon the department in which he wishes to specialize, and the adviser approves, the student takes his election card to the head of that department for approval. In cases where students are not ready to designate a department of specialization they continue as general majors during the sophomore year under the direction of an adviser assigned by the head of the School in which the student is enrolled. Such general majors must select their field of specialization by the end of the sophomore year.

During the junior and senior years the student is under the guidance of the head of the department in which he is majoring or an adviser assigned by him.

Automobiles

Members of the freshmen and sophomore classes under 21 years of age and students who are on probation of any kind are not permitted to have automobiles on the campus or in the town of Amherst. All students who are privileged to have automobiles on campus are required to register their vehicles with the Campus Police at the time of registration, or immediately after bringing their automotive equipment to the campus for the first time. Driving to and from classes is strictly forbidden, except for those students who have severe physical limitations.

SCHOLARSHIPS AND LOANS

Scholarships are awarded only to needy and deserving students of high character whose habits of life are economical and whose scholastic records are satisfactory. A limited number of these scholarships are available for entering freshmen.

Scholarships are paid in installments at the beginning of each semester in the form of a credit on the student's bill. A scholarship may be discontinued at the close of any semester.

If the scholarship student withdraws from the University, any refund of University fees or charges must first be applied to reimburse the scholarship fund for the full amount of the scholarship received by the student for the semester.

Applications for scholarships may be obtained from Fred P. Jeffrey, Stockbridge Hall, and must be completed and returned by March 15 to be considered.

GENERAL SCHOLARSHIPS

COMMONWEALTH SCHOLARSHIPS. The Commonwealth of Massachusetts annually provides 25 scholarships of not more than $250 for members of each of the four undergraduate classes of the University. Upperclass students may obtain application forms from Fred P. Jeffrey, Stockbridge Hall. Entering freshmen may obtain application forms at the Registrar's Office.

LUCIUS CLAPP FUND to provide scholarships and loans to deserving students.

HENRY GASSETT SCHOLARSHIP for a worthy undergraduate student.

CHARLES A. GLEASON SCHOLARSHIPS. General scholarship for worthy students.

WHITING STREET SCHOLARSHIP. Scholarships of $50 each for deserving students.

GEORGE H. BARBER SCHOLARSHIP. A limited number of scholarships awarded on the basis of leadership, need, scholarship and participation in extra-curricular activities.

DANFORTH KEYES BANGS SCHOLARSHIP for the aid of industrious and deserving students.

THE ALPHA SIGMA PHI SCHOLARSHIP for needy students.

RESTRICTED SCHOLARSHIPS

Area Scholarships

Frederick G. Crane Scholarships for the aid of worthy undergraduate students, preference being given to residents of Berkshire County.

Boston Alumni Club Scholarship. A limited number of scholarships awarded on the basis of leadership, need, scholarship and participation in extra-curricular activities. Available only to incoming freshmen from Greater Boston.

Betsey C. Pinkerton Scholarships. Two general scholarships for graduates of the schools of the city of Worcester.

Wilbur H. H. Ward Scholarships. Twenty-five scholarships of approximately $100, known as the Wilbur H. H. Ward Scholarships. The Wilbur H. H. Ward Fund is administered by a Board of Trustees independent of the University. Applicants for these scholarships write to Sumner R. Parker, 1 Sunset Court, Amherst. They are available only to Hampshire County Boys.

Class Eligibility Scholarships

Class of 1882 Scholarships for the aid of a worthy student of the junior or senior class.

College of Agriculture

Alvord. For students specializing in the study of dairy husbandry or dairy manufacturing with the intention of becoming an investigator, teacher, or special practitioner in the dairy industry. Restricted to students who do not use tobacco or fermented beverages.

O. G. Anderson Memorial Fund. For needy and worthy students in Pomology. To be used for the purchase of books and supplies. Granted only on the recommendation of the Department of Pomology.

Ascension Farm. For men students in the College of Agriculture. Residents of Berkshire County have preference, but awards may be made to students from Hampshire, Hampden, and Franklin Counties.

Borden. One scholarship of $300 to be awarded to a Senior in the College of Agriculture who has the highest scholarship average in all work through the Junior year and who has completed two or more courses in dairying.

Boston Market Gardeners' Association. A $100 scholarship for a Sophomore in agriculture. Applications should be made to

the Secretary of the Boston Market Gardeners' Association, 240 Beaver Street, Waltham 54, Massachusetts.

Boston Stewards' Club. For students in Food Management. Three $100 scholarships awarded as recommended by that department.

Buttrick. For junior, senior or graduate students majoring in Dairy Industry or Food Technology. Scholarships will range from $100 to $500 per year depending upon scholarship achievement and need.

The Charles M. Cox Trust Fund Scholarship of $300 is awarded to a student or students in the College of Agriculture on the basis of need, character and scholarship ability. Preferably the scholarships will be awarded to undergraduate majors in dairy husbandry or poultry husbandry.

Lotta Crabtree. For students in the College of Agriculture. Based on scholarship and need.

Danforth Foundation. Summer scholarships for outstanding freshman and senior students in Agriculture. For attending a summer camp sponsored by the Danforth Foundation.

Esso. Scholarships are based on membership in 4-H Club, and applications should be sent to county 4-H Club agents. Scholarship is for $400—($100 per year) for students enrolled in some course of agriculture.

J. W. D. French Fund. For students in Dairy and Forestry, and allied subjects.

Charles H. Hood Foundation. Awarded to two Juniors and two Seniors in the College of Agriculture, with preference given to those studying the production of milk. Based on scholastic standing, character, industry, and personality.

Margaret Motley. For a woman student majoring in Floriculture or Landscape Gardening. Need, scholarship, and promise of success form the basis of award.

New England Club Managers' Association. For students in Food Management who are recommended by that department.

Porter L. Newton. For students majoring in Agriculture who are residents of Middlesex County.

Frank H. Plumb. For students majoring in the College of Agriculture.

V. A. Rice Scholarship Fund. A $100 scholarship for a worthy student majoring in Animal Husbandry.

Sears-Roebuck Foundation. Four scholarships for outstanding freshman in the College of Agriculture, based on scholarship,

leadership, personality, business ability, or special achievement. The outstanding freshman recipient is eligible for a special Sophomore scholarship.

Springfield Garden Club. For students living in the vicinity of Springfield, Massachusetts and majoring in some phase of Horticulture.

Statler Hotel. For a student in Food Management, and recommended by that department.

Treadway Hotels. For students in Food Management who have worked for the Treadway organization and who are recommended by the Department of Food Management.

Union Agricultural Meeting. A $250 scholarship for the Senior in the College of Agriculture having the highest scholastic standing and who has not been given another award based primarily on scholarship.

Engineering Alumni Scholarships

Provided by annual contributions from graduates and friends of the School of Engineering to provide tuition scholarships to deserving and well-qualified students pursuing work in a major field of Engineering. They are available to freshmen and upperclassmen.

Military Scholarships

United States Army ROTC Scholarship. The U. S. Army Reserve Officers Training Corps, in conjunction with the Division of Physical Education, offers a scholarship of $150 to an entering male student. This scholarship is renewable for three years, to a young man with a good scholastic record in secondary school, who possesses leadership qualities and can meet the physical requirements for commission as a second lieutenant in the Army Reserve. The applicant must agree to enroll in the basic course, Army ROTC, and to apply for the advanced course, ROTC.

United States Air Force ROTC Scholarships. The U. S. Air Force Reserve Officers Training Corps in conjunction with the Department of Physical Education offers two scholarships of $150 each to two sophomore male students. These scholarships are solely for tuition and fees and may be renewed for three additional years. They are awarded to students who possesses leadership qualities, meet the physical standards required for commissions in Air Force Reserve, have a good scholastic record in secondary school and agree to enroll in the basic course, Air Force ROTC, and to apply for the advanced course, Air Force ROTC.

4-H Scholarships

Cotting Memorial Scholarship. All college expenses of freshman year—for a woman student. Recipient of this scholarship is selected by a committee of the New England Branch of the Farm and Garden Association from among candidates proposed by State Leaders of 4-H Club work in the New England states.

George L. Farley Scholarships. The Massachusetts Society for Promoting Agriculture has established a scholarship in memory of George L. Farley. The income of approximately $60 per semester is awarded to deserving 4-H Club members, men or women, recommended by the State Leader of 4-H Clubs from applications submitted by County 4-H Club Agents.

Scholarships for Women Students Only

Chi Omega Award. The local chapter of the Chi Omega Sorority offers an annual scholarship of $25 to that woman student majoring in the department of economics or psychology who has the highest scholastic average at the end of the first semester of the senior year.

Helen A. Whittier Scholarship for a deserving woman student in art as applied to living.

The Mortar Board Award. An award by Mortar Board, the senior women's honorary society, to a young woman student at the end of her junior year. This award is made on the basis of character and personality, scholastic achievement, campus influence and service.

Polish Junior League Scholarship. An award by the Polish Junior League to a woman student of Polish descent, at the end of her junior year, paying full tuition for the senior year. The basis of this award is character and scholastic achievement.

LOANS

Through the generosity of friends of the University, funds have been donated to provide loans for a limited number of students of the three upper classes to assist in paying tuition or other college expenses. These loans are granted, after proper consideration, to needy students of good scholarship whose habits are economical. All loans are secured by a note endorsed by a responsible party as collateral. All such loans must be paid before graduation. Upon withdrawal from the University, loans automatically become due. Interest is charged at the rate of 3% to maturity, 5% thereafter on loans from all funds except the Lotta Agricultural Fund, from which loans are made without interest. Application for loans

should be made to the Student Aid Committee, Placement Service Office, South College. No loan will be granted in excess of $200 in any one year.

If funds are available at the beginning of the second semester, loans may be made in exceptional cases to members of the Freshman class whose scholastic record is satisfactory and whose budget calculations have been upset through circumstances beyond their control.

Danforth Keyes Bangs Fund. This is a gift of $6,000 from Louisa A. Baker of Amherst, the income of which is used in aiding poor, industrious and deserving students to obtain an education at the University of Massachusetts.

Lotta Agricultural Fund. A limited number of loans are made to students from the income of this fund. Such loans are made without interest but only to deserving students of high scholastic rank. This fund is administered by a Board of Trustees independent of the University although loans are made only upon the recommendation of the President of the University.

Vincent Goldthwait Memorial Loan Fund. A gift of $5,000 from Dr. Joel E. Goldthwait in memory of his son. This fund is used almost entirely for students in the Stockbridge School of Agriculture.

Frank A. Waugh Foundation. Graduates of the Department of Landscape Architecture and friends of Professor Frank Waugh have established this fund, to be used in part for loans to deserving seniors and fifth year students of that department. Requests for loans shall be reviewed and approved by the head of the department of Landscape Architecture and submitted to the Board of Trustees of the Foundation, who shall make final decision as to granting of the loans and amounts thereof.

4-H Scholarship and Loan Fund. This fund is under the supervision of the State Leader of the 4-H Clubs and is used to aid students preparing for agricultural and home economics service.

National Pest Control Association Loan Fund. A fund established by the National Pest Control Association for needy students in the field of Entomology.

HONORS, PRIZES, AWARDS

Scholarship Honors

Departmental Honors. A student who has shown outstanding promise within some department and has maintained a general scholastic average of B or better is permitted to apply for the privilege of registering for departmental honors. If his appli-

cation is accepted by his department and the Honors Committee, he is allowed to pursue a course of independent study within the department of his choice throughout his senior year. This may include intensive reading, investigation or laboratory work in connection with some problem that he chooses for his consideration. The objective is to create initiative power of independent investigation and to develop the spirit of research. Although the student is responsible for his undertaking he is encouraged to consult with his department in regard to his work should the need arise. At the close of his study the student presents a thesis covering his investigation. In addition he may be required to appear for an oral or written examination. If by the excellence of his work he satisfies all the requirements of his department and the Honors Committee, his name will appear on the commencement program as receiving honors in the field of his specialization.

Scholastic Prizes

Phi Kappa Phi Award for Scholarship. Massachusetts Chapter of the Phi Kappa Phi, scholarship honor society, offers an award of $50 for outstanding work in scholarship. This is given to some member of the senior class at the opening of school in the fall. The award is based on the record of the first three years.

The Burnham Prizes. These were made possible through the generosity of Mr. T. O. H. P. Burnham of Boston. Prizes of $25 and $15 are awarded through the Department of Speech to those students delivering the best and second best declamations in the Burnham contest. Preliminary contests are open under certain conditions to freshmen and sophomores.

The Flint Prizes. The Flint Speaking Contest was established in 1881 by a gift of the late Charles L. Flint, a former president of the University. After his death the prizes were continued by college appropriation. Awards of $25 and $15 are presented through the Department of Speech as first and second prizes respectively to those two upperclassmen delivering the best extemporaneous speeches in the contest.

The Hills Botanical Prize. This is given through the generosity of Henry F. and Leonard M. Hills of Amherst, for the first and second best herbaria. Competition is open to members of the senior, junior and sophomore classes. First prize is $20, second prize $15.

The Betty Steinbugler Prize in English. This prize was endowed by John L. Steinbugler, New York City, in honor of his daughter Elizabeth Steinbugler Robertson, a graduate of this

University in 1929. It is awarded to a woman in the junior or senior class who has written the best long paper on a subject of literary investigation in a course in English during the year.

Massachusetts Society for Promoting Agriculture Prizes. Three prizes of $25, $15, and $10 are awarded to those senior students who are judged to have made the best records in the theoretical and practical work in agriculture required in their course of study, and in the special written and oral examination prepared for this award.

Athletic Awards

The Allan Leon Pond Memorial Medal. This medal is awarded for general excellence in football in memory of Allan Leon Pond of the class of 1920, who died February 26, 1920. He was a congenial companion, a devoted lover of Alma Mater, a veteran of World War I, a fine all-round athlete and a true amateur. He would rather win than lose, but he would rather play fair than win. He has been characterized as a typical student of the University.

The William T. Evans Memorial Trophy. This trophy is given each year to that member of the varsity football team who through his sportsmanship, football ability, character and personality, has thus exemplified the character and spirit of the person in whose memory this memorial trophy is dedicated. The trophy is dedicated to the memory of William T. Evans, a former member of the class of 1942, who died December 9, 1941. This trophy is presented annually by the class of 1942.

The Thomas E. Minkstein Memorial Award. This award is made by the class of 1931 in memory of their classmate who died July 16, 1930 while he was captain-elect of football. The award is given to one of the outstanding men in the Junior class who has as nearly as possible attained those standards of athletics, scholarship and leadership set by him whose memory this award honors.

The George Henry Richards Memorial Cup. This cup is awarded annually to the member of the basketball team who shows the greatest improvement in leadership, sportsmanship, and individual and team play during the year. It is in memory of George Henry Richards of the Class of 1921 who died suddenly while a student at the College.

The Joseph Lojko Memorial Plaque. This plaque is presented to a senior who must be a letter man, have a satisfactory scholastic record and show those qualities of enthusiasm and coopera-

tion which make for leadership. It is awarded in honor of Joseph Lojko of the Class of 1934, outstanding athlete who died while a senior in the College.

The Samuel B. Samuels Basketball Cup. This cup is presented annually in the name of Samuel B. Samuels of the Class of 1925 who was an outstanding basketball player during the early years of basketball as a varsity sport at the University. The trophy is awarded to that letter man who is a regular member of the varsity team and who has performed with excellence during scheduled varsity games.

The E. Joseph Thompson Memorial Trophy. This baseball trophy is given by Thomas Thompson in memory of his brother, E. Joseph Thompson who graduated from Massachusetts State College in 1932. He was president of the Student Senate, a varsity letter man in football and baseball, and an outstanding campus citizen. The award goes to that member of the varsity baseball team who best exemplifies the most admirable characteristics of the sport each year.

Varsity Club Track Plaque. This plaque is presented by the Alumni Varsity M Club each year at its Commencement meeting to that member of the track team who is considered to have been the most valuable member of the team during the past season.

Paul Sears Putnam Memorial Tennis Trophy. This trophy is awarded to that member of the varsity tennis team who has displayed by his conscientious endeavor, clean play, good sportsmanship and all-around ability as an athlete and scholar, that he is a credit to his team and University, and shall have his name inscribed on the trophy. He shall also be presented with a suitable medal or watch charm. The trophy is established in memory of Paul Sears Putnam, '38, by the members of his family, in the hope that it will stimulate and encourage students to emulate his characteristics of whole-hearted enthusiasm and good sportsmanship, true cooperation and the constant endeavor to always give to the best of their ability in any project they may undertake.

Maurice Suher Soccer Plaque. This trophy is to be awarded annually to that letterman of the varsity team who is deemed to have been the most valuable member of the team. It is presented to the University by Maurice Suher of the class of 1930. Maurie was one of the two students largely instrumental in having soccer recognized as a varsity sport at the University. He played on the first varsity soccer team at the U. of M., in the fall of 1929.

Chester F. Bowen Jr. Memorial Award. The class of 1949 presented the Chester F. Bowen Jr. Memorial Award in track and

cross-country to the University as its class gift. Members of the class felt that this gift would be the most appropriate which they could give the University, since it would be a fitting memorial to a former classmate and a worthy award for the outstanding athlete in varsity track and cross-country.

Varsity Club Hockey Plaque. This plaque shall be awarded annually at the Commencement meeting of the Varsity Club, to that member of the hockey team who is considered to have been the most valuable player to the team.

Samuel S. Crossman Memorial Trophy. This award is made to the member of the senior class who must have received two varsity awards, had an above average academic record, and possessed qualities of enthusiasm, cooperation, leadership, and be recognized as the outstanding student-athlete on the campus. The trophy was established by the University Athletic Council. The award is dedicated to the memory of Samuel S. Crossman and consists of a trophy upon which the name of the student chosen is to be inscribed. A small replica will be presented for his permanent possession.

MILITARY HONORS AND AWARDS

Leadership, scholarship, and proficiency in the work of the military department are recognized by honors and awards announced at the Annual Federal Inspection in May.

United States Army Reserve Officers Training Corps, Armor Branch

Distinguished Military Students. Each year the Professor of Military Science and Tactics designates as distinguished military students those members of the first year advanced course who possess outstanding qualities of leadership, high moral character, and a definite aptitude for the military service. Students who are so designated must possess an academic standing in the upper half of their class or in the upper ten per cent of their class in military subjects. All distinguished military students are authorized to wear the distinguished military student badge.

Distinguished Military Graduates. Each year the Professor of Military Science and Tactics designates as distinguished military graduates those members of the graduating class who were previously designated as distinguished military students and have maintained the same high standards required for such designation and have successfully completed training at the Reserve Officers' Training Camp.

The Military Order of the Loyal Legion Trophy. Awarded annually by the Military Order of the Loyal Legion to the senior armor cadet ranking No. 1 in military scholarship and proficiency. Winner's name is engraved on a plaque and a sterling silver goblet, appropriately engraved, is given to the individual to keep in his permanent possession.

The U. S. Armor Association Scroll. Awarded annually by the U. S. Armor Association to the outstanding Armor cadet graduating from the Senior ROTC class. An engraved scroll bearing the name of the winner is presented to the winning cadet to keep in his personal possession.

Armed Forces Communications Association Honor Award. Awarded annually by the Armed Forces Communications Association to the outstanding Senior ROTC cadet majoring in electrical engineering. The winner is presented with an appropriately engraved gold medal and scroll.

The Military Science Trophy. Awarded annually by the Department of Military Science, University of Massachusetts, to the Junior Armor cadet ranking No. 1 in military scholarship. The name of the winner is engraved on a sterling silver goblet given to the individual to keep in his permanent possession.

The Reserve Officers Association Medal. Awarded annually by the Reserve Officers Association of the United States, Massachusetts Department, to the Junior Armor cadet who is outstanding in military proficiency. The winner's name is engraved on a plaque and a medal, appropriately engraved, is given to the individual to keep in his personal possession.

The Elizabeth L. McNamara Trophy. Awarded annually by Mrs. Elizabeth L. McNamara, a trustee of the University of Massachusetts for many years, to the Armor cadet ranking No. 1 in scholarship in the second year basic course. The winner's name is engraved on a plaque and a sterling silver goblet, appropriately engraved, is given to the individual to keep in his permanent possession.

The John C. Hall Trophy. Awarded annually by the Military Science Department, University of Massachusetts, to the Armor cadet ranking No. 1 in military proficiency in the second year basic course. The winner's name is engraved on a loving cup donated by the class of '02 in the name of John C. Hall.

The Amherst Rotary Club Trophy. Awarded annually by the Amherst Rotary Club to the Armor cadet ranking No. 1 in scholarship in the first year basic course. The winner's name

is engraved on a plaque and a sterling silver goblet, appropriately engraved, is presented to the winner to keep in his personal possession.

The Military Science Award. Awarded annually by the Department of Military Science, University of Massachusetts, to the Armor cadet ranking No. 1 in military proficiency in the first year basic course. The winner's name is engraved on a gold medal which is presented to him to keep in his personal possession.

Rifle Team Award. Awarded annually by the Varsity Rifle Team, University of Massachusetts, to the team member who fires the highest cumulative match score for the season. The winner's name is engraved on a gold cup which is presented to him to keep in his personal possession.

United States Air Force Reserve Officers Training Corps

Distinguished Military Student. Each year the Professor of Air Science and Tactics will select from the students who are completing the second year advanced course, AFROTC, those who possess outstanding qualities of character, leadership, and a definite aptitude for the military service for designation as Distinguished Military Students.

Distinguished Military Graduate. Each year the Professor of Air Science and Tactics will designate the distinguished Military Graduates from those Distinguished Military Students who have completed the advanced course, AFROTC, and who will receive their baccalaureate degree. The Distinguished Military Graduates, with their consent, may compete for a regular Air Force Commission after serving on active duty for eighteen months.

Air Science Trophy. Awarded annually by the Department of Air Science to the Air Science freshman cadet most outstanding in Military and Academic Scholarship. The trophy is a silver cup appropriately engraved which is given to the winner.

Sons of American Revolution Medal. Awarded annually by the Sons of the American Revolution to an Air Science Sophomore cadet selected for Leadership, Soldierly Bearing and General Excellence. The winner's name is appropriately engraved on a medal which is presented to the individual.

Amherst Post American Legion Trophy. Awarded annually by the Amherst Post American Legion to the Air Science sophomore cadet who has demonstrated the most outstanding abilities in Military Drill and Scholarship. The trophy is a suitably engraved silver cup.

Air Cadet Squadron Trophy. Awarded annually by the Air Cadet Squadron to an Air Science sophomore cadet who has been an outstanding member of the Air Cadet Squadron and Drill Team. A silver cup appropriately engraved with the individual's name is presented to the winner.

Air Science Trophy. Awarded annually by the Department of Air Science to the Air Science junior cadet who has displayed outstanding military proficiency and maintained a high scholastic standing. A silver cup appropriately engraved with the individual's name is presented to the winner.

Air Force Association Medal. Awarded by the Air Force Association to the most outstanding Air Science junior cadet. The award is a suitably engraved medal which is presented to the winner.

Reserve Officers Association Medal. Awarded by the Massachusetts Reserve Officers Association to the graduating Air Force cadet who has been outstanding in Scholarship and Military Proficiency. The award is a medal appropriately engraved, which is presented to the winner.

Northampton Benevolent Protective Order of Elks Trophy. Awarded annually by the Northampton Lodge, BPOE, to the Air Science senior who by his zeal, effort and initiative has contributed most to the Corps of Air Cadets. The trophy is a suitably engraved silver cup which is presented to the winner.

Daniel Fungaroli Trophy. Awarded annually by Mr. Daniel Fungaroli to the Air Science senior cadet who has been most outstanding at Summer Camp. The trophy is a silver cup appropriately engraved, which is presented to the winner.

Air Science Trophy. Awarded by the Department of Air Science annually to the graduating Air Science senior cadet who has demonstrated superior qualities of Leadership, Military Bearing and Scholarship. The trophy is a silver cup appropriately engraved, which is presented to the winner.

STUDENT ORGANIZATIONS

One of the values received from the University course is the training one acquires through participation in student activities. Student organizations offer excellent opportunities for development of leadership and broadening of outlook.

Student Government

The student Senate operating under the student constitution and composed of elected representatives from the student body is the governing council of undergraduates. Its aim is to promote the general welfare of the University and, in doing so, groups of both students and faculty meet to further their mutual interests. The student Senate directs student conduct and represents the interests of the student body before the faculty.

Academic Honor Societies

Phi Kappa Phi. The Massachusetts Chapter of the Honor Society of Phi Kappa Phi was installed on the campus in 1904. Its prime object is to emphasize scholarship and character. Senior students from all departments of the University are eligible for election to membership provided the scholastic and character requirements of the Society are met.

Sigma Xi. The Society of Sigma Xi is a scientific fraternity to which members are elected on the basis of outstanding scientific research. The local chapter was established in 1938.

Omicron Nu. The Alpha Pi chapter of the Society of Omicron Nu was installed on the campus in 1952. The purpose of the Society is to recognize superior scholarship and to promote leadership and research in home economics. Membership is open to juniors and seniors majoring in home economics who meet the requirements of the Society.

Phi Tau Sigma. Phi Tau Sigma Honorary Society is the international honor society for food science. It was founded at the University of Massachusetts in 1953, and its executive headquarters are permanently located here. Its purpose is to encourage and recognize achievement in food science. Senior students from all departments related to food science are eligible for election to

membership if they meet scholastic and character requirements of the University Chapter.

Sigma Gamma Epsilon. The Beta Theta chapter of the Sigma Gamma Epsilon Fraternity was installed at the University of Massachusetts in 1951. The purpose of the Fraternity is to stimulate scholastic, scientific, and social advancement of its members and the extension of the relations of friendship and assistance between the universities and scientific schools with recognized standings in the United States and Canada, which are devoted to the advancement of the earth sciences. Membership is open to men majoring in geology, mining, metallurgy, ceramics, petroleum engineering, or other branches of earth sciences, who meet the requirements of the Fraternity.

Phi Eta Sigma. The Society of Phi Eta Sigma was installed on the campus in 1955 to recognize outstanding scholastic achievement by freshmen men.

Tau Beta Pi. The Massachusetts Zeta chapter of Tau Beta Pi was installed on the campus in the fall of 1955. The Society exists for the purpose of honoring engineering students of high scholarship and character, and who also participate in campus activities. Senior and junior students in the School of Engineering are eligible for election to membership if they meet the requirements of the Society.

Sigma Delta Psi. The Society of Sigma Delta Psi was installed on campus in 1955 to promote physical, mental and moral development of college men.

Service Fraternity

Alpha Phi Omega. A fraternity which renders various kinds of service to the University. The group is composed of former members of the Boy Scouts of America.

Student Honor Societies

Adelphia. The men's senior honor society, recognizing students who have been leaders in the extra-curricular activities of the campus.

Mortar Board. The Isogon Chapter of Mortar Board was installed at the University of Massachusetts in 1955. The purpose of the Society is to promote college loyalty, to advance the spirit of service and fellowship among University women, to maintain a high standard of scholarship, to recognize and encourage leadership, and to stimulate and develop a finer type of college women. Membership is composed of a total of not less than five or more than twenty-five girls from the senior class selected on the basis of service, scholarship, and leadership.

Maroon Key. Men's sophomore honor society, comprised of 25 students elected at the end of the freshman year.

Scrolls. Women's sophomore honor society, comprised of 15 students elected at the end of the freshman year.

Fraternities and Sororities

Social fraternities on the campus include Alpha Epsilon Pi, Alpha Gamma Rho, Alpha Sigma Phi, Alpha Tau Gamma, Delta Sigma Chi, Kappa Kappa, Kappa Sigma, Lamdba Chi Alpha, Phi Mu Delta, Phi Sigma Kappa, Q.T.V., Sigma Alpha Epsilon, Sigma Phi Epsilon, Tau Epsilon Phi, Theta Chi. An Inter-Fraternity council, consisting of representatives of these fraternities, has charge of rushing and all general matters dealing with fraternity life.

Sororities include Chi Omega, Kappa Alpha Theta, Kappa Kappa Gamma, Phi Delta Nu, Pi Beta Phi, Sigma Delta Tau, and Sigma Kappa. The Pan-Hellenic Council, made up of representatives from the sororities, supervises rushing and other sorority matters.

Extra-Curricular Activities

All extra-curricular activities are supervised by the Committee on Recognized Student Organizations composed of alumni, faculty, and students. Recognition is given in the annual award of gold and silver medals.

The Collegian. This is a tri-weekly newspaper published by undergraduates.

The Quarterly. A magazine in which the literary and artistic efforts of the students are published.

Index. The year book.

University Handbook. Published annually as a campus book of reference.

Ya Hoo is the campus humor magazine published three times a year.

University Musical Organizations. Open to all students of the University. For instrumentalists: Band, Dance Band, Orchestra and Ensembles; for vocalists: Chorus, Chorale, Operetta Guild and small combinations. A Women's Drill Team, the Precisionettes, performs at home games and ceremonies. The University Concert Association provides an annual series of major concerts by famous artists.

Drama. Drama is represented on the campus by the Roister Doisters, open to all four-year students interested in the art of the theater; and the University Players, open to those students who

have shown outstanding ability, effort, and interest in some phase of dramatics through the Roister Doisters.

In addition, there are approximately 100 student organizations which offer an opportunity to interested students who participate in small group meetings.

Inter-Collegiate Athletics

The University Intercollegiate Athletic Program is supervised by the University Athletic Council and is composed of the following members: five faculty members appointed by the President, three alumni representatives appointed by the Directors of the Alumni Association, the Executive Secretary of the Alumni Association, and ex officio, the Director of Athletics.

The University believes there are educational advantages in participating in a well-organized intercollegiate and intramural sports program. In intercollegiate athletics, the University is represented by teams in all the leading sports, including football, soccer, cross-country, basketball, swimming, wrestling, indoor and outdoor track, hockey, rifle and pistol, baseball, tennis, golf, lacrosse, gymnastics, skiing.

The University also supports a broad program of intramural activities, in which all students are encouraged to participate. The range of sports available each year includes the team sports of touch football, basketball, softball, volleyball. Individual activities include tennis, bowling, badminton and golf.

The University of Massachusetts is a member of the Yankee Conference, the National Collegiate Athletic Association, the Eastern College Athletic Conference, the Association of New England Colleges for Conference on Athletics, and the I.C.A.A.

Professional Clubs

There are numerous professional clubs, established in connection with the various major courses of study. These clubs stimulate the students' professional interest in their chosen subject matter fields and afford opportunity for discussion of technical subjects of mutual interest.

UNIVERSITY BUILDINGS

The campus is laid out in the form of an oval, attractively set off by the College Pond in the center. Around this oval are grouped the main buildings of the University. An alphabetical list of buildings follows.

Abigail Adams House. Women's dormitory accommodating 100 students. Erected in 1919 and named for Abigail Adams, wife of John Adams, second President of the United States.

Alumni Field. So called because both funds and labor for its construction were contributed by alumni and students. Included are two regulation baseball diamonds, three practice football fields, two soccer fields, one lacrosse field and a cinder track. Twenty-four tennis courts are adjacent to the Physical Education Building.

Arnold House. Women's dormitory accommodating 205 students. U. of M. Building Corporation dormitory, erected in 1954 and named in honor of Sarah Louise Arnold, former trustee of the University.

Athletic Field for Women. A large field west of the Physical Education Building provides space for archery, softball, field hockey and other women's activities.

Baker House. U. of M. Building Corporation dormitory for men, accommodating 360 students. Erected in 1951 and named in honor of Hugh P. Baker, President of the University from 1933 to 1947.

Bowditch Lodge. Headquarters for 4-H Club activities. Erected in 1936 by funds contributed by 4-H Club members and interested friends and organizations. Named to honor Nathaniel Bowditch, Trustee of the University from 1896-1945.

Brooks House. U. of M. Building Corporation dormitory for men, accommodating 180 students. Named in honor of William Penn Brooks, Professor of Agriculture and Director of the Experiment Station, 1888-1921.

Butterfield House. Erected in 1941 by the U. of M. Building Corporation. Accommodates 147 students and has a dining hall. Named in honor of Kenyon L. Butterfield, President of the University from 1906-1924.

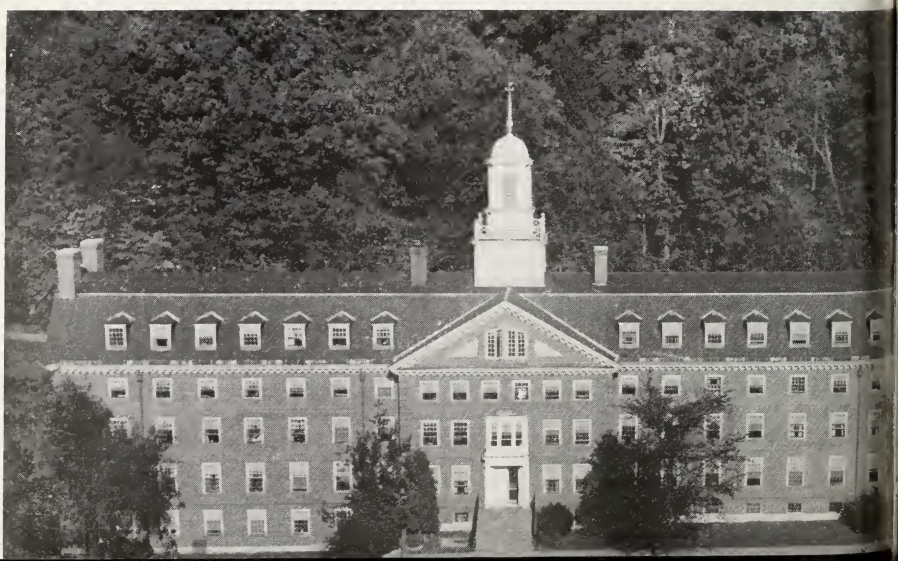
Chadbourne House. Men's dormitory for 150 students. Erected in 1946 under the sponsorship of the U. of M. Building Corporation. Named in honor of Paul Ansel Chadbourne, President of the University from 1866-67 and 1882-83.

A FEW *Campus* SCENES

GOODELL LIBRARY

A Fast Growing Campus ◇ ◇ ◇

LEWIS HOUSE—WOMEN'S RESIDENCE AREA



More Than 700 Acres

in the

HEART OF CAMPUS
LIBRARY AND OLD CHAPEL

Beautiful

Connecticut River Valley

PHYSICAL EDUCATION BUILDING

A Multi-Million Dollar ◆ ◆ ◆

THE UNIVERSITY DINING COMMONS

HASBROUCK (TOP) AND PAIGE LABORATORIES

Expansion Program ◆ ◆ ◆

TO MEET THE NEEDS OF MASSACHUSETTS YOUTH

SKINNER HALL — HOME ECONOMICS

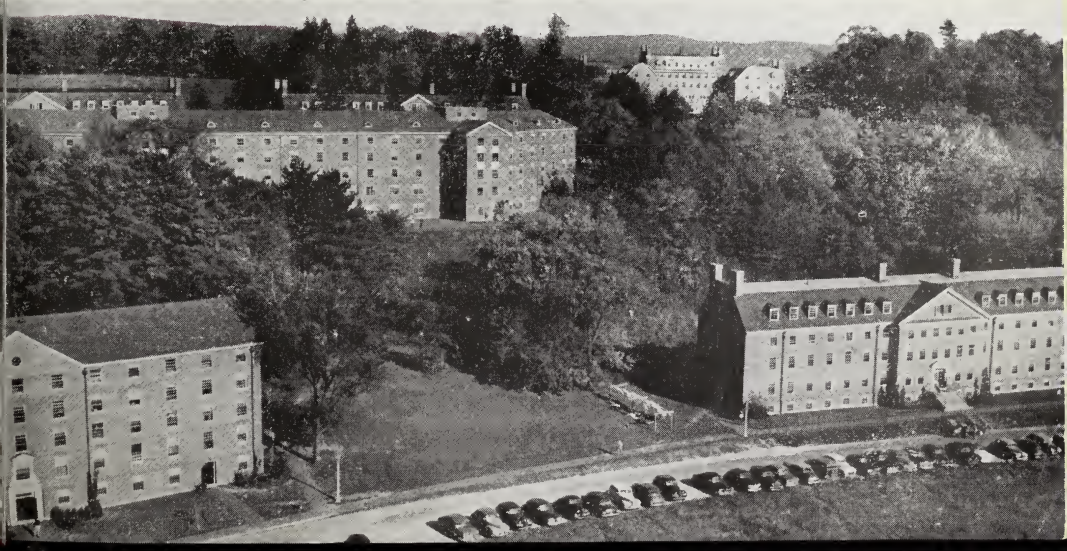
High Quality Education ◇ ◇ ◇

AERIAL VIEW—WOMEN'S AREA AND COMMONS

OLD
CHAPEL

at Low Cost

DORMITORIES — MEN'S RESIDENCE AREA



Did You Know . . .

☆ state universities educate the majority of Americans who go to college.

☆ the University of Massachusetts lies within 12 miles of the geographical center of the state.

☆ the University leads New England in the total number of science graduates who have gone on to receive doctorate degrees.

☆ the University's largest enrollment is in the College of Arts and Science.

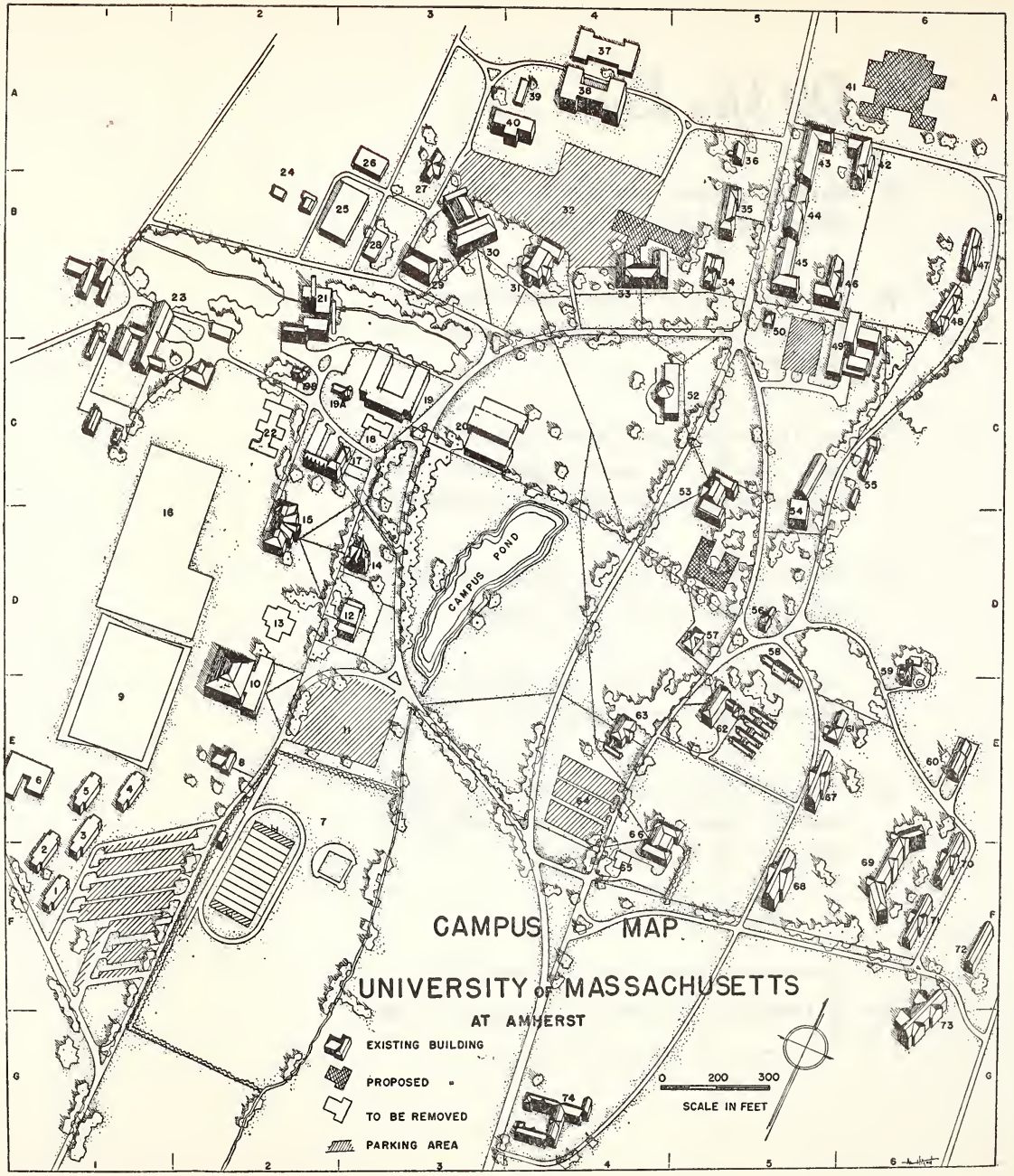
☆ undergraduate degrees are offered in 59 fields and graduate degrees in 35.

☆ the University has one of the largest resident enrollments of any college or university in Massachusetts.

UNFOLD TO VIEW CAMPUS MAP

CAMPUS KEY

No.	Location	Name	Utilization
1	F-1	Suffolk House	Dormitory
2	F-1	Plymouth House	Dormitory
3	E-1	Hampshire House	Dormitory
4	E-1	Middlesex House	Dormitory
5	E-1	Berkshire House	Dormitory
6	E-1	Armor Garage	ROTC Tanks
7	F-2	Alumni Field	Athletic Fields
8	E-2	Munson Hall	Extension Service
9	E-1	Women's Athletic Field	Soccer, Archery
10	D-2	Curry Hicks Physical Education Building	Division of Physical Education
11	F-2	South Parking Lot	Parking
12	D-3	Memorial Hall	Alumni Office—Music Department
13	D-2	Drill Hall	ROTC Headquarters, Physical Education for Women
14	D-3	Old Chapel	Liberal Arts Headquarters
15	D-2	Goodell Library	Library
16	D-1	Tennis Courts	
17	C-2	South College	Administration
18	C-3	North College	Faculty Offices
19	C-3	Machmer Hall	Classrooms
19A	C-2	Bowditch Lodge	4-H Club House
19B	C-2	Farley 4-H Club House	4-H Club House
20	C-3	Student Union	Student Activities
21	B-2	Power Plant	Utilities Service
22	C-2	Liberal Arts Annex	Class Rooms
23	B-1	University Farm	Cattle Buildings
24	B-2	University Farm	Poultry Buildings
25	B-2	Engineering Annex	Engineering Labs
26	A-3	Engineering Shop	Agricultural Engineering
27	A-3	Drama Workshop	Roister Doister Society
28	B-3	Chenoweth Laboratory	Food Technology Department
29	B-3	Flint Laboratory	Dairy Industries
30	B-3	Stockbridge Hall	Bowker Auditorium, Classrooms, Agricultural Faculty Offices
31	B-4	Draper Hall	School of Business
32	B-4	North Parking Area	Parking
33	B-4	Goessmann Laboratory	Chemistry Department
34	B-5	West Experiment Station	Experiment and Control Services
35	B-5	Abigail Adams House	Dormitory
36	A-5	The Homestead	Home Management Practice House
37	A-4	Gunness Laboratory	Engineering
38	A-4	Main Engineering Bldg.	Engineering, Nursing
39	A-4	Animal Isolation Bldg.	Veterinary Science
40	A-4	Paige Laboratory	Main Veterinary Science Building
41	A-6	New Physical Education Building for Women	Under Construction
42	A-6	Leach House	Dormitory
43	A-5	Hamlin House	Dormitory
44	B-5	Arnold House	Dormitory
45	B-5	Knowlton House	Dormitory
46	B-6	Crabtree House	Dormitory
47	B-6	Lewis House	Dormitory
48	B-6	Thatcher House	Dormitory
49	C-6	University Commons	Cafeteria
50	B-5	East Experiment Station	Research and Control
51	C-5	Public Health Building	To Be Constructed
52	C-4	Hasbrouck Laboratory	Physics Department
53	C-5	Skinner Hall	Home Economics
54	D-5	Marshall Hall	Bacteriology and Public Health
55	C-6	University Infirmary	Medical Services
56	D-5	Conservation Building	Forestry and Wildlife Management
57	D-5	Wilder Hall	Landscape Architecture
58	D-5	New Durfee Range	Tropical Plant House
59	D-6	President's House	President's Residence
60	E-6	Fisher Laboratory	Pomology
61	E-5	Wildlife Laboratory	Animal Conservation Research
62	E-5	French Hall	Horticulture
63	E-4	Clark Hall	Botany
64	E-4	East Parking Lot	Parking
65	F-4	Mathematics Building	Speech
66	E-4	Fernald Hall	Entomology, Geology and Mineralogy, Zoology
67	E-5	Brooks House	Dormitory
68	F-5	Mills House	Dormitory
69	F-6	Baker House	Dormitory
70	F-6	Greenough House	Dormitory
71	F-6	Chadbourne House	Dormitory
72	F-6	Van Meter House	Dormitory
73	G-6	Butterfield House	Dormitory
74	G-4	University Apartments	Faculty Residence



Chenoweth Laboratory. Classrooms and laboratories including Commercial Practice Laboratory for the Department of Food Technology. Erected 1929 and named in honor of Walter W. Chenoweth, pioneer in the field of Food Technology and first Head of the Department.

Clark Hall. Offices, lecture rooms, laboratories, and greenhouses of the Department of Botany are located here. The herbarium contains about 122,000 sheets of seed plants and ferns, 5000 sheets of liverworts, mosses, algae, lichens, and a collection of 20,000 specimens of fungi. The building was erected in 1906 and named in honor of William S. Clark, President of the University and Professor of Botany from 1867 to 1879.

Conservation Building. Formerly the Old Botany Museum, erected 1867. Houses laboratories, classrooms and offices for the Department of Forestry and Wildlife Management.

County Circle. Five residence halls erected in 1948 by the Commonwealth. Hampshire and Suffolk Houses contain 30 two-room and three-room apartments for married persons and their families. Plymouth, Berkshire, and Middlesex Houses contain dormitory rooms for approximately 144 students each.

Crabtree House. U. of M. Building Corporation dormitory housing 154 students, completed in 1953. Named for Lotta Crabtree, benefactress of the University.

Dining Commons. Central University dining commons for men and women students.

Dramatic Workshop. Headquarters for instruction in stagecraft.

Draper Hall. Classrooms and offices of the School of Business Administration; also department of agricultural economics and farm management. Erected in 1903 and renovated in 1954. Named in honor of James Draper, for 20 years a Trustee of the University.

Drill Hall. Contains offices of the departments of Military and Air Science, and offices, locker and dressing rooms, and exercise hall of Department of Physical Education for Women.

Durfee Conservatories. New Durfee Conservatories were erected in 1954. They contain collections of plants of various types, including desert, tropical and sub-tropical, botanical and horticultural importance. These greenhouses replace the Durfee Planthouses erected in 1867 from money given by Dr. Nathan Durfee of Fall River, Treasurer of the Board of Trustees.

East Experiment Station. Headquarters for Recognized Student Organizations.

Engineering Annex. Laboratories, classrooms, and offices for the School of Engineering. Erected in 1948.

Main Engineering Building. First wing completed in 1950 provides laboratories for industrial electronics, communications, ultra high frequency, electrical measurements, illumination and metal-

lurgy, as well as classrooms and offices for the School of Engineering. Building completed in 1955. Addition contains laboratories for civil engineering in soil mechanics, sanitary engineering, applied mechanics and structural engineering, industrial engineering laboratories for time and motion studies and work simplification. New metallurgical facilities include new processing laboratory, X-ray and non-destructive testing equipment. Mechanical engineering and the School of Engineering laboratories are also housed here. The University radio studio, together with its transmitter are housed on the first floor and the campus weather station will be located on the third floor. This building serves also as temporary headquarters for the School of Nursing and contains office space for several members of the history department.

Farley 4-H Club House. Headquarters for 4-H Club activities. Erected in 1933 by funds contributed by 4-H Club members and interested friends and organizations. Named to honor George L. Farley for 25 years State Leader of County Club Agents.

Farm. In the University barns are maintained Percheron and Morgan horses; Aberdeen-Angus, Ayrshire, Guernsey, Hereford, Jersey and Holstein cattle; Shropshire and Southdown sheep and Chester White swine. The university farm is operated as a livestock farm, producing all its necessary roughage in the form of pastures, hay and silage and a portion of its required grain.

Fernald Hall. Erected in 1909 and named in honor of Professor Charles H. Fernald who served the University from 1886 to 1909, built a strong Department of Zoology, created the Department of Entomology, and acted as Director of the Graduate School. Fernald Hall houses the Departments of Entomology and Geology and offices and classrooms of the Department of Zoology. Offices and laboratories of the Western Sanitary District, Massachusetts Department of Public Health, are also located here. The Entomology collection includes over 160,000 insects. There are also Geological and Zoological museums.

Fisher Laboratory. Erected in 1910 and named for Jabez Fisher, one of the foremost early horticulturists of the state. Laboratories for Pomology are located here, including a quick freezing room, six refrigerator rooms, two rooms for the storage of frozen products, two classrooms, and three packing rooms.

Flint Labratory. Laboratories and classrooms for dairy and animal science. Erected in 1911 and named for Charles L. Flint, fourth president of the University.

French Hall. Erected in 1908 and named in honor of Henry F. French, first President of the University. This building houses the Departments of Floriculture, Pomology, and Olericulture. In the

rear of the building is the Edward A. White range of greenhouses, built in 1908, enlarged in 1939, and devoted to the growing of carnations, roses, chrysanthemums, etc. One house is maintained as a conservatory and contains a collection of plants used primarily for decorative purposes.

Goessmann Laboratory. Contains eight large laboratories, an auditorium, chemical library, and lecture rooms. The east wing of the third floor is used by the Experiment Station chemists. The remainder of the building is for resident instruction in Chemistry. Erected in 1924 and named in honor of Charles A. Goessmann, first Professor of Chemistry at the University. A large addition to this building will be under construction during 1957-58.

Goodell Library. Goodell Library is named in honor of Henry Hill Goodell who served the University from 1867-1905. He was President from 1886 to 1905 and because of his deep enthusiasm for books also acted as Librarian of the University.

This library houses the main collection of the University library system and has the central card catalog and the catalog and processing units for both the main and departmental libraries.

Goodell Library is a fireproof building erected in 1935. Its plan is virtually unique among University libraries in that the greater part of its book-stacks are open for inspection and borrowing. The present collection in the building amounts to approximately 152,000 volumes including books and extensive files of periodicals.

The collections in the Goodell Library include the books and periodicals in the Humanities and Social Sciences together with some of the material in the Natural and Applied Sciences.

The main floor includes a large reading room, a reference room, circulation desk, reference and current periodical desk, both in the main lobby, and cataloging and administrative offices. On the second floor is another large reading room, commonly used for reserve book reading. There is a study for faculty and a University History Room in memory of Dean William L. Machmer in which the historical records of the University are kept and exhibited.

Besides the Goodell Library there are thirty-seven department libraries totaling about 38,000 books and bound periodicals located in the several University buildings with the teaching departments and laboratories. These libraries vary from small working libraries to extensive collections in special fields. Particularly worthy of note are the Botany, Chemistry, and Entomology libraries.

The complete library system contains 190,055 volumes (Sept. 1, 1954) and is growing at the rate of over 7,000 volumes a year. The library regularly receives over 1,000 periodicals, and also the serial publications of learned societies. It is also a depository for govern-

ment documents of the United States Department of Agriculture and the various State Experiment Stations.

Greenough House. Men's dormitory housing 148 students and dining hall. U. of M. Building Corporation dormitory erected in 1946 and named in honor of James Carruthers Greenough, President from 1883-1886.

Grinnell Arena and Abattoir. Erected in 1910 primarily for livestock judging. An abattoir was constructed in 1930 as an addition to the original building. Named in honor of James S. Grinnell, for twenty-two years a trustee of the University.

Gunness Laboratory. Laboratories for industrial combustion engines, material testing, fluid mechanics, heating, air conditioning and refrigeration, electrical machinery, electrical circuits, as well as classrooms and offices for the School of Engineering. Built in 1948 and named in honor of Christian I. Gunness, Professor of Agricultural Engineering from 1914 to 1946.

Hamlin House. U. of M. Building Corporation dormitory, housing 175 students. Erected in 1949. Named for Margaret P. Hamlin, first Placement Officer for Women, from 1919 to 1948.

Hasbrouck Physics Laboratory. Completed in 1949. Contains laboratories and lecture rooms designed for the various main divisions of physics. Named in honor of Philip B. Hasbrouck, Professor of Physics and Registrar of the University during the period 1905 to 1924.

Hatch Laboratory. Laboratory where small animals and chickens are used in connection with investigations into human, animal and poultry nutrition.

Curry S. Hicks Physical Education Building. Erected in 1931 from funds contributed by alumni and friends of the University, plus an appropriation by the state legislature. Contains a large swimming pool, an exercise hall, basketball floor, and locker rooms. Named for Curry S. Hicks, Professor and Head of the Division of Physical Education from 1911 to 1949.

Homestead. Girls majoring in home economics receive their home management practice here. This is a fine old colonial homestead newly equipped with all the modern conveniences of the home.

Infirmary. A group of three buildings, one for bed patients, one for out patients and a third for contagious cases.

Knowlton House. U. of M. Building Corporation dormitory which accommodates 175 women students. Erected in 1950 and named in honor of Helen Knowlton, Associate Professor of Home Economics, 1924-1941.

Leach House. U. of M. Building Corporation dormitory housing 154 students. Erected in 1953 and named in honor of Mrs. Joseph A. Leach, Chairman of the Women's Advisory Council and former Trustee of the University. French House is located here. Native French persons are always in residence to encourage French conversation.

Lewis House. Women's dormitory accommodating 150 students. Erected under sponsorship of the U. of M. Building Corporation in 1940 and named in honor of Edward J. Lewis, Dean of the University 1914-25 and President 1925-27.

Liberal Arts Annex. Offices for psychology and journalism. A temporary structure erected in 1947.

Machmer Hall. A $1,000,000 classroom building, providing offices and instruction facilities for the departments of economics, education, German, government, mathematics, philosophy, recreation, Romance languages and sociology. Named for William Lawson Machmer, Dean of the University from 1926 to 1953.

Marshall Hall. Erected in 1915 and named for Dr. Charles Marshall, a former Professor of Bacteriology and Director of the Graduate School. Building provides laboratories and classroom space for the department of bacteriology and the department of zoology.

Mathematics Building. Temporarily housing offices of speech department and research facilities for geology.

Memorial Hall. Erected in 1921 by alumni and friends in memory of those men who died in World War I. Included is a Memorial Room in which the names of those members of the University family who died in the service of their country are appropriately enshrined. This building houses the alumni headquarters, also the department of music.

Mills House. U. of M. Building Corporation dormitory for 150 students. Erected in 1948 and named in honor of George F. Mills, teacher of English from 1890 to 1914 and Head of the Division of Humanities.

Munson Hall. Headquarters for the Division of Youth Work (4-H) and Department of Agricultural Communications. Named in honor of Willard A. Munson, a graduate of the University in 1905 and Director of the Extension Service from 1926 to 1951.

Old Chapel. Erected in 1885. Auditorium, seminar room, classrooms and offices for English and history.

Paige Laboratory. Erected in 1950 and named in honor of James B. Paige, a graduate in the class of 1882 and Professor of Veterinary Science from 1891-1922. The building contains classrooms and laboratories. Laboratories for State Control and research work in animal diseases are also located here.

Poultry Plant. Consisting of a number of modern buildings, in which instruction and research in ventilation, breeding, feeding, incubation, brooding, marketing and management of poultry and poultry enterprises take place. Rhode Island Reds, Barred Plymouth Rocks, White Plymouth Rocks, New Hampshires and S. C. White Leghorns and several other breeds are maintained here on a commercial basis.

Power Plant. General maintenance of the University.

Shade Tree Laboratories. Constructed in 1948 for research on shade tree problems, including Dutch Elm Disease.

Skinner Hall. Laboratories, classrooms and offices for the School of Home Economics. Erected in 1947 and named in honor of Edna L. Skinner, first Dean of the School of Home Economics.

South College. Administration building, including offices of President, Treasurer, Provost, Secretary, Registrar, Dean of Arts and Science, Dean of Graduate School, Director of Placement Service, Dean of Women, Dean of Men, and Director of Publications. Erected 1885.

Stockbridge Hall. Administrative offices of the College of Agriculture and the departments of agronomy, animal husbandry and poultry husbandry are located here. Erected in 1914 and named for Levi Stockbridge, first Professor of Agriculture and former President of the University. Bowker Auditorium, the main auditorium on the campus, is also located here. It is named for William H. Bowker, a member of the first graduating class, trustee of the University, and one of the pioneers in the fertilizer industry.

Stockbridge House. Faculty Club House.

Student Union Building. A $2,000,000 structure, just completed under the sponsorship of the U. of M. Building Corporation, for recreational facilities for all students. Contains ballroom, offices for student activities, University store, offices of the University chaplains, meeting rooms and dining rooms.

Thatcher House. Women's dormitory with facilities for 150 students. Erected in 1935 and named in honor of Roscoe W. Thatcher, President from 1927-32.

Van Meter House. U. of M. Building Corporation dormitory housing 165 men students. A second wing is now under construction. It was named for Dr. Ralph A. Van Meter, 13th President of the University, who retired in 1954.

West Experiment Station. The State Control Service is centralized here. Feeds, fertilizers, and seeds are analyzed or inspected in accordance with state law. Erected in 1886.

Wilder Hall. Contains classrooms, drafting rooms and offices of the department of landscape architecture. Erected in 1905 and named for Marshall P. Wilder, a pioneer in the movement of agri-

cultural education in Massachusetts, and one of the University's first Trustees.

Wildlife Laboratory. Laboratories for graduate students in wildlife management.

Buildings Under Construction

Van Meter House. An addition to the wing completed in 1955 is now in progress. Expected completion date, September, 1957.

Goessmann Laboratory Addition. A $1,747,000 addition to the chemistry laboratory facilities. Expected date of completion, September, 1957.

Women's Physical Education Building. A $1,621,000 structure located adjacent to the women's residence area, providing complete facilities for the Department of Physical Education for Women, including gymnasium and swimming pool. Expected date of completion, September, 1957.

Public Health Building. A $1,281,000 structure to accommodate public health services in western Massachusetts, the University's department of bacteriology and public health and the School of Nursing. This building will form the core unit of a $3,500,000 science center.

SPECIAL SERVICES

Religious Life

The University makes an effort to provide a wholesome and stimulating spiritual atmosphere for the students by cooperating with official agencies of the three faiths most largely represented at the University.

On the campus the religious life of Catholic students is enriched by the Newman Club, of which Father David J. Power of Saint Brigid's Parish is chaplain. Jewish students may participate in services and activities at the local Hillel House, under the chaplaincy of Rabbi Louis Ruchames of Northampton; and Protestant students may join in worship and other religious activities conducted by the Student Christian Association, under the guidance of the Reverend Albert Seely, chaplain to Protestant students.

The churches of Amherst provide not only the usual opportunities for worship and participation in church work, but special events for students. Students are particularly encouraged to attend Sunday service in the local church of their respective faiths.

Health Service

The Health Service is a separate administrative unit dealing with all matters directly or indirectly influencing or affecting the health of staff members, employees, students, or campus visitors.

The University endeavors to safeguard the health of all students while on the campus. Basic medical attention is provided, including preliminary diagnosis, primary treatment of injuries, and temporary care of the sick. A group of three infirmary buildings and a staff of resident physicians and resident nurses is available to perform these functions.

(1) The Student Health physicians have offices in the out-patient Infirmary Building, where they may be consulted during college hours.

(2) The Infirmary consists of three buildings, one for bed patients, one for contagious cases, and one for out-patient cases, where the out-patient clinic is conducted daily by the Student Health physicians.

(3) The students are urged to consult the resident physicians at the first sign of physical disorder, or even for minor accidents. Many severe illnesses and much lost time may be avoided by early or preventive treatment.

(4) House calls cannot be made to dormitories, sororities, or fraternities except in the case of emergency. The University cannot assure each student that a resident physician will always be available. In such instances students are encouraged to consult a town physician, although any expense connected with such service shall be borne entirely by the student. One resident physician is on call at all times to care for emergencies beyond the scope of the nurse on duty.

(5) No charge is made to Infirmary bed patients up to seven days in each school year; time in excess of seven days will be charged at the rate of $4 per day. A nominal charge may be made to out-patients for miscellaneous treatments.

(6) In addition to the fee charged as specified in paragraph 5, the following additional expenses will be charged to the patient:

Nurses. If a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the resident nurse.

Professional Service. If a student requires continuous medical attention by a physician, he may be required to select a town physician and become responsible for fees charged by that physician.

Supplies. Special medical supplies prescribed by a physician will be charged to the patient.

Laundry. Expenses for personal laundry incurred by students while in the infirmary will be charged to the individual student.

(7) The Health Service recommends strongly that students participate in the blanket insurance program described in literature accompanying the initial bill rendered students each year. This program is a reimbursement insurance plan providing medical, surgical, and hospital care for both accident and illnesses at a very low cost. During the past years this plan has saved numerous patients from serious unexpected expense and the insurance payments have enabled the student to stay in school. The University has no financial interest in this and acts only as a clearing

house to receive premiums, in order to give the low group rate.

The Placement Service

The University maintains a centralized Placement Service, the function of which is to assist students to secure part-time, summer, or permanent employment and to administer the required Placement Training Program.

The University is keenly interested that each graduate has an opportunity to serve his fellow men in a socially desirable occupation consistent with his interests, abilities, aptitudes, and education. To assist students to accomplish their objectives, the following aids are available: cumulative student personnel records, occupational information, library, counselling and guidance in job hunting techniques, preparation of credentials and personal data sheets and personal interviews.

The Placement Service is the clearing center for all part-time jobs at the University. Students are assisted in obtaining part-time work during the college year and full-time work during the summer vacation. Employment is not guaranteed, but every effort is made to help those students who must work to meet their college expenses. In order to give assistance to as many needy students as possible, the Student Aid Committee has adopted the policy of limiting the maximum financial aid per student to the equivalent of board. The average earnings of students engaged in part-time work is approximately $100.00 per year.

Publications and News Office

The University recognizes its obligation to provide the public with accurate information about its educational program.

Providing such information is the function of the Publications and News Office which edits the University catalogues and the school bulletin series and services communications media such as newspapers and radio stations. This is a public service program and not a publicity operation.

The Publications and News Office also supervises a Student News Bureau which affords internship training in news writing to a limited number of students.

Alumni Association

The Associate Alumni is the general organization of the Alumni, men and women, of the University of Massachusetts. The association maintains headquarters at Memorial Hall, erected by Alumni and friends in honor of those men of the University who died in World War I.

It publishes a magazine, *The Massachusetts Alumnus,* as the alumni publication of the University.

According to its By-Laws the Corporation is constituted for the purpose of promoting the general usefulness of the University of Massachusetts; of cultivating among its graduates and former students a sentiment of mutual regard; and of strengthening their attachment to their Alma Mater.

Under sponsorship of the U. of M. Building Corporation, comprised of alumni who volunteer their services, 14 dormitories, a faculty apartment building and a Student Union Building have been constructed on the campus.

The governing body of the Associate Alumni consists of its officers and a Board of Directors. Four directors are elected each year and serve a term of four years. All graduating seniors become members of, and contributors to, the Association at graduation, according to a tradition set by the Class of 1940.

SPECIAL INSTITUTES AND SERVICES

Bureau of Government Research

A Bureau of Government Research was established at the University of Massachusetts on October 1, 1955. The Bureau is staffed by professional personnel experienced in local government research. Its work consists of research, publication and cooperative activities with local government officials of the Commonwealth.

College English Association

The offices of the Executive Director of the College English Association are maintained in South College. This is a national association of teachers of college English. The organization's monthly publication, *The CEA Critic,* is edited and published on the campus.

New England Field Training Center

Sponsored jointly by the U. S. Department of Public Health, Education and Welfare, and the University's Department of Bacteriology and Public Health, the New England Field Training Center for health department sanitarians has been located on the campus since 1949. The center instructs a limited number of health department sanitarians annually through in-service training courses.

UNDERGRADUATE CURRICULA

Undergraduate instruction is organized into the College of Arts and Science, the College of Agriculture, the Schools of Business Administration, Education, Engineering, Home Economics, Nursing, and the Division of Physical Education for Men.

This section of the catalogue deals with the opportunities for study and the curricula available in each of these departments of the University.

COLLEGE OF ARTS AND SCIENCE

FRED V. CAHILL, JR., *Dean*

The College of Arts and Science includes those departments offering instruction in the humanities, the physical and biological sciences, and the social sciences. Its curricula comprise both general education courses essential for enlightened citizenship and those necessary for specialized and professional training.

The work of the first two years is largely prescribed, specialization occurring in the junior and senior years. The concentration of the junior and senior years gives the student as high a proficiency in his field of specialization as is possible without sacrificing the objectives and requirements of a well-rounded education.

The majority of the curriculum prescribed for all freshmen and sophomores, regardless of their fields of specialization, is taught in the College. In addition, each of the departments of the College offers courses leading to undergraduate specialization in its particular field. There are also curricula designed to meet the special needs of pre-medical, pre-dental, and pre-veterinary students; of those planning to enter the public health service; and of those interested in social work.

In sum, the College provides training for: persons primarily seeking a liberal education; those who, wishing to go on to specialization in one of the fields of the College, seek a liberal education and the beginnings of specialization; those, in other parts of the University, whose basic professional interests are outside the range of, but who receive liberal education within, the College.

FRESHMAN YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 1	2	English 2	2
Speech 3	1	Speech 4	1
Math. 7	3	Math. 8 or 10	3
[1]Zoology 1, Botany 1, or Geology 1	3	[1]Botany 1, Zoology 1, or Geology 1	3
Foreign Language	3	Foreign Language	3
[2]Elective		[2]Elective	3
Military 1 (men)	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Physical Education 7 (women)	2	Physical Education 8 (women)	2

[1] Those intending to major in the humanities or social sciences may take Chemistry 1 and 2 in place of Botany 1, Zoology 1, or Geology 1. Students intending to major in Bacteriology, Botany, Chemistry, Entomology, or follow the pre-medical or pre-dental curriculum take Botany 1 and Zoology 1.

[2] Those planning to major in biological and physical science departments or follow the pre-medical or pre-dental curriculum take Chemistry 1 and 2 (or 4); others take History 5 and 6.

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25	3	English 26	3
Sociology 25, Psychology 26, or Economics 25	3	Economics 25, Sociology 25, or Psychology 26	3
[1]Science	3-4	[1]Science	3-4
[1]2 electives	6-7	[1]2 electives	6-7
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2
Physical Education 33 (men)	1	Physical Education 34 (men)	1

[1] In selecting the required science course and the two electives, students should be guided by the recommendations for sophomore work given under the descriptions of junior-senior curricula that follow. The sciences available are:

Bacteriology 31
Botany 1, 25, 26, 28, 30
Chemistry 1, 2, 4, 29, 30, 33
Entomology 26
Geology 1, 28
Mathematics 29, 30
Physics 25, 26
Zoology 1, 25, 35

JUNIOR-SENIOR CURRICULA

Major work is available in the following departments during the last two years.

Bacteriology

R. L. FRANCE, *Adviser*

The courses in bacteriology have been planned to furnish (1) a general and applied training for students majoring in other departments who must have some knowledge of bacteria and (2) specialization for those contemplating a professional career in bacteriology.

Students majoring in bacteriology should complete the following courses in their sophomore year: Chemistry 29 and 30, Zoology 35, and Bacteriology 31. Physics 25 and 26 are advised and may be elected junior year by bacteriology majors.

During the junior and senior years the following courses should be taken: Chemistry 51, 52, and 79; Zoology 69 and 84; Public Health 61, 62, and 88; Bacteriology 51, 52, 56, 81, 82, 85, or 95.

Botany

T. T. Kozlowski, *Adviser*

The purpose of the courses in botany is to provide a thorough background for specialization in the science, and to support and supplement the work of other fields in which knowledge of plant life is held to be important. Certain courses should likewise prove of interest and value to the general student.

Those who wish to specialize in botany will find here an ample field and an adequate opportunity for advanced undergraduate study. Post-graduate training, often with provision for financial aid, is available in most graduate institutions, and many teaching, research and industrial positions in schools and colleges, experiment stations, federal and state services and private enterprise are open to the trained botanist.

The curriculum offers to the student an opportunity to acquire either a broad general knowledge of botany, or to devote himself to more extensive study in one of the major divisions of the science, such as Plant Morphology and Taxonomy, Plant Physiology, Mycology and Plant Pathology. Under the direction of his adviser each student selects a program of courses in botany and other sciences, humanities and arts which seems best adapted to his particular botanical objectives.

Specialization in botany assumes the satisfactory completion of certain basic and supporting courses prior to the junior year. These include Botany 1, 25 and 26; Chemistry 1, 2 and 29; and a modern language. Two years of German are advised.

The junior-senior program requires that courses in botany to the amount of 15-30 credits be chosen under the guidance of the adviser. He will also make recommendations in regard to electives.

Chemistry

W. S. Ritchie, *Adviser*

The objectives in chemistry are to give the student an understanding of the subject which will enable him to appreciate the relation of chemistry to other sciences, and to industry, and to provide training for those who intend to become teachers and workers in the allied sciences, and for those who wish to go on to graduate study and into a professional career in chemistry. Completion of

the course in chemistry fits the student for positions in the chemical industries and related fields as well as in the agricultural industry, for employment in state and Federal agricultural experiment stations and commercial laboratories, for teaching and for graduate study.

Students planning to major in chemistry should elect German in the freshman year. The sophomore program should include Chemistry 29, 30; Mathematics 29, 30; and Physics 25, 26, German 25, 28.

In the junior year the chemistry major takes Chemistry 51, 52, 65, and 66. In the senior year he takes Chemistry 83, and elects at least three of the following courses: Chemistry 77, 81, 82, 86, 93, 94.

Economics

P. L. GAMBLE, *Adviser*

In economics the aims are twofold: (1) to give the student an understanding of economic theory and of the application of economic principles to the organization of society; (2) to provide students with the elementary training necessary for further study of economic and business problems.

The department requires that all majors irrespective of the career desired take the following courses: Economics 53, 73, 79, Accounting 25, and Statistics 79 or Mathematics 62. In addition, each student must select an additional 12 credit hours of work from the Economics curriulum. No major student is permitted to take more than 36 junior-senior credit hours of economics, agricultural economics and business administration courses. In choosing elective courses students are urged to select courses in the humanities and preferably some from the allied fields of history, philosophy, government, psychology, and sociology. Those intending to major in economics should elect Economics 26 in the sophomore year.

For the majors in the Economics department, there are offered courses which may be combined to serve as preparation toward a number of different careers. Among others, possible careers in the following fields are open:

- Banking and Finance
- Government Service
- International Trade
- Labor and Personnel Relations
- Public Utilities
- Social Security
- Statistics
- Transportation and Communication

English

M. H. GOLDBERG, *Adviser*

The department of English offers courses in English composition, language, and literature. Students majoring in this department must conform to the institutional and school requirements for freshman and sophomore years, and in choosing sophomore electives should include two semesters of modern language and one semester of English history.

The courses in English are intended to enable students to express themselves effectively and to appreciate humanistic values and the ideals of English-speaking people throughout their history. They also offer an appropriate, and in some instances an adequate, classroom training for work in such fields as teaching, authorship and editing.

The student majoring in English must earn 30 credits in elective courses in English. However, for six of these he may substitute elective courses in technical writing, other languages or speech.

Entomology

C. P. ALEXANDER, *Adviser*

Courses in entomology serve a variety of functions, such as to give students a broad knowledge of insects, particularly in their relations to man, his crops, his animals, and his health. Students are trained to become entomologists in the service of the United States, or in various state, territorial, or foreign services, especially in the field of agriculture. Other fields of training include forest entomology; medical entomology; control of pests in buildings; research, technical service or sales work with manufacturers of insecticides; teachers of zoology, particularly entomology, at the university level; and various other branches.

The courses in beekeeping are offered with the following aims: (1) to meet the increase in vocational opportunities for the production of bees or honey as a business; (2) to study the beekeeping needs of fruit and truck-crop industries and the part that bees play in the pollination of flowers; (3) to acquaint the student with a recreational field that can be made profitable.

Majors are required to take Entomology 26 in the sophomore year. Strongly recommended sophomore subjects include Botany 25, 26; Zoology 25, 35; Chemistry 29, 30; and foreign language.

Juniors and seniors should support their work in entomology with the following courses: Botany 51, 52; Bacteriology 61, 62; Chemistry 51, 52; Zoology 51, 69, 70; Pomology 56; English 84, and selected courses in education, floriculture, forestry, horticulture, and other subjects.

Geology and Mineralogy

H. T. U. Smith, *Adviser*

The offerings in geology and mineralogy are intended chiefly for those who wish to gain some acquaintance with one or more branches of earth science. For the general student prerequisite requirements are reduced to a minimum. A program of moderate specialization may be provided for science majors who are interested in geology.

To major in geology a student must complete thirty credit hours of work in the department. Those who have completed nine or more credits in geology in addition to the sophomore courses by the end of the junior year, and who wish to satisfy major requirements for graduation in the field of geology, will be given individual or group problems in the senior year. The nature of the work will depend upon student interest and preparation. In any junior or senior course in geology an additional period per week without credit may be required of students who specialize in this field. Chemistry through qualitative analysis and a year's work in college physics represent minimum requirements in these respective fields for undergraduate specialization in physical geology. For those interested in pursuing studies in stratigraphy or paleontology, work beyond the freshman year in the systematic aspects of both botany and zoology is essential for satisfactory progress.

German

F. C. Ellert, *Adviser*

The courses in German are intended to give a practical knowledge of the language for the purpose of wider reading, research, and oral communication.

During the junior and senior years each student will complete not less than 24 and not more than 30 credits in the junior-senior German courses. German 59, 79, and 80 are required of all major students. Students planning to use the language professionally are also urged to supplement their courses here with a summer session at an approved school of German.

Government

John Harris, George Goodwin, Jr., *Advisers*

The courses offered by the department of government are designed to aid the student in gaining a knowledge of the nature, functions, and problems of government, and of the place of government in the modern world. Political theory, constitutional law, international relations, comparative government, politics and public administration are the principle areas covered.

Students taking work in government may prepare themselves for (1) graduate study in political science and government, (2) careers in public administration at federal, state, and local levels, (3) re-

search concerning governmental problems, (4) the study of law, (5) entrance into the foreign service, (6) teaching government and social science courses in secondary schools.

Majors in the field should elect Government 25 and 26 in their sophomore year. In the junior and senior years a minimum of eight additional courses in government is recommended. In addition, supporting courses in the fields of history, economics, sociology, psychology, or philosophy are suggested.

History

T. C. CALDWELL, *Adviser*

The courses in history are intended to impart an understanding of the people of the world and their problems through an analysis of man's development in the past. A major in this field should provide the student with a broad cultural background and a basis for good citizenship. History may have special value for the following groups:

(1) Those who plan to teach history or the social studies.

(2) Those who plan careers in which considerable knowledge of history is desirable. These might be in fields such as law, government service, journalism, and library work.

Prospective majors should ordinarily elect History 31 and 32 in the sophomore year. Government 25 is recommended. Major students must earn a minimum of 25 credit hours in history from the junior and senior courses. The following courses are required: History 59, 60, 91, 92. The student must elect one of the following courses which deal with a period prior to 1500: History 51, 62, 73. In addition, he should select, in consultation with his adviser, a program of elective courses from fields related to the major.

Journalism

A. B. MUSGRAVE, *Adviser*

The journalism program is concerned with (1) the study of communication problems relevant to the media of mass communication, and (2) the best utilization of the University's liberal education resources by students who plan careers in newspaper work, communications research, public relations, magazine and radio journalism, or some other field of communications.

For such students the journalism courses are intended to provide both increased communication skill and relevant background. The courses may have special value also for students who plan to go into government service, law, education, and similar fields in which knowledge of the process and effects of communication is particularly useful.

The courses emphasize (1) the professional responsibilities of the mass media in a free society, (2) communications research, and

(3) study of the reporting of those issues in public affairs which may be evaluated as contemporary history.

English-Journalism majors take five literature courses, English 84, and four journalism courses. Such students should select, in consultation with their adviser, an integrated program of elective courses to obtain the broadest and most liberal training.

Mathematics

A. E. Andersen, *Adviser*

The department offers courses designed to furnish a cultural background as well as a foundation for both undergraduate and graduate work in such fields of science as physics and chemistry, in engineering and in other technical subjects.

The courses recommended for majors in the department are designed to prepare students for high school teaching, graduate study in mathematics, actuarial work, statistical work, or work as engineering aides.

All majors are required to take Mathematics 29 and 30 and Physics 25 and 26 in the sophomore year. In the junior and senior years each major must take Mathematics 53, 54, 91, and 92 and must, in addition, complete at least 12 credits in other junior-senior courses. Prospective majors should consult the department, for a list of recommended courses.

Music

D. J. Alviani, *Adviser*

The courses in music are open to all university students depending on their training, experience, ability and talent. The department of music supervises and directs the activities of a number of musical organizations which offer opportunities to students for the development of skill in playing, singing, acting, and attitudes for artistic growth of intellectual, practical, and social intelligence. Music courses furnish an understanding of the history and interpretation of music, a knowledge of basic theory, and training in applied music.

The music major student is expected to adjust his elective courses to fit his individual needs in preparation for work in the fields of: music education, music merchandising, private teaching, the ministry, the armed forces, church music, private school music, kindergarten music, bi-subject teaching, music library administration, music in radio, television, recreation and industry, institutional music therapy, and advanced study in music.

During the sophomore year all music majors must elect Music 25 and 26. They are required to take four semesters of Applied Music before graduation, two of which must be in Piano. Each major student will be required to pass an examination in Piano not later than junior year.

Philosophy

C. SHUTE, *Adviser*

Philosophy seeks a comprehensive understanding of the various areas of man's experience in their interrelatedness. In the context of the historically important theories, the courses concentrate on methods of inquiry into the persisting questions of philosophy, standards of thought, clarification of ethical and aesthetic values, and the bases of criticism.

The student majoring in this subject will complete a minimum of 21 credits in junior-senior courses in philosophy. A wide range of supplementary courses is advised, among which the following are suggested: Art 75, 78; Chemistry 88; Education 51; English 72, 74, 79, 80; French 51, 52; German 56, 57; Government 66, 71, 72; Mathematics 72; Music 51, 52; Psychology 61, 90; Sociology 53, 82.

Physics

W. F. POWERS, *Adviser*

The courses give opportunity for the study of basic physical laws. From these courses students may make a selection to satisfy a major in physics, or to comply with requirements for graduate study.

Majors must take Physics 25, 26 and Mathematics 29, 30 in the sophomore year. Juniors and seniors are advised to support their physics major courses by electives in mathematics, such as differential equations and vector analysis. Since the interests of major students vary, the department adviser will be glad to make suggestions regarding programs of study.

Pre-Medical and Pre-Dental Curriculum

Advisory Committee: L. M. BARTLETT, *Chairman,* H. RAUCH, W. S. RITCHIE, W. H. ROSS, J. H. SMITH.

Pre-medical and pre-dental students should register with a member of the pre-medical advisory committee as soon as possible after entering the university. Pre-veterinary students may register with the pre-medical advisory committee or with the school of their choice. Pre-medical or pre-dental students will be assigned a member of the committee as adviser, and as long as they remain pre-medical or pre-dental students they will continue under this adviser. The assignment is made alphabetically as follows: A-C, Dr. Bartlett; D-G, Dr. Smith; H-L, Dr. Ritchie; M-R, Dr. Rauch; S-Z, Dr. Ross. During the second semester of the student's sophomore year the committee will review his academic record and will schedule an interview for the purpose of considering his general qualifications. After careful study, specific recommendations will be made as to whether the student should continue with the curriculum or change his objective and choose another major. Each

student remaining in the program will again be interviewed during his junior year.

Medical schools do not look with favor on over-specialization in any field. They stress the importance of a broad general education. Therefore, in addition to a major of the student's own choosing, he should include courses beyond the introductory level in other fields, especially the humanities and social sciences. The student is to decide upon his electives only after consultation with his adviser.

During the sophomore year students should elect Chemistry 29 (second semester unless specializing in Chemistry), Physics 25 and 26 and a foreign language. Other required courses are Chemistry 30, 51, and 52; Zoology 71 and 72.

Psychology

C. C. NEET, *Adviser*

The courses in the psychology department are designed (1) to impart an understanding of behavior and the application of this knowledge to problems of human adjustment; and (2) to give preparation for professional work in psychology and related fields.

Careers open to psychology majors include: teaching and research, guidance, psychometrics, personnel and industrial work, child welfare, abnormal and clinical psychology, opinion polling, social work and government service. Additional training is required for certain of these careers.

Students planning to major in psychology should elect Psychology 26 and Psychology 28 in the sophomore year. In the junior and senior years majors are advised to take a minimum of 24 credits in psychology. Courses 51 and 90 are required. As broad a cultural background as major programs will permit is advised.

Majors planning careers primarily in experimental and physiological psychology should plan to take one or more courses during their four years in mathematics, physics, and zoology. Those planning careers in abnormal and clinical psychology and in child welfare should elect specified courses in education, English, sociology, and zoology; while those planning careers in psychometrics, guidance, personnel and industrial work, and government service should take certain courses in business administration, economics, education, industrial engineering, and sociology.

Public Health

R. L. FRANCE, *Adviser*

The Department of Bacteriology, through the cooperation of several departments of the university and the Massachusetts Department of Public Health, offers curricula for (1) a limited number of students interested in the many phases of public health serv-

ice for which graduate work in medical or engineering schools is not essential; and (2) students planning graduate work in sanitary engineering.

Particular attention will be given to the training of sanitarians, district sanitary officers, food and milk inspectors, water and sewage treatment plant operators, technicians for public health laboratories, and agents for local boards of health. Students planning graduate work in sanitary engineering must also take Mathematics 29 and 30 (calculus) before the end of their junior year.

Students electing this major should complete the following courses during their sophomore year: Chemistry 29, Physics 25 and 26, Zoology 35 and Bacteriology 31.

During junior and senior years the following courses should be completed: Chemistry 51 and 52; Bacteriology 81 and 90; Public Health 61, 62, 63, 84, and 88. Supporting courses in other departments will be selected with the guidance of an adviser.

Recreation Leadership

W. E. Randall, *Adviser*

The department seeks to prepare students for positions involving administrative, supervisory, and program leadership responsibilities in municipal recreation agencies, voluntary and youth-serving agencies, hospitals, and industrial and institutional organizations. Students who plan a career in recreation should register as early as possible with the department.

The program is designed to provide opportunities for a broad liberal education, a knowledge and understanding of people and society, activity skills and resource knowledge, professional competency, and practical experience in various leadership situations. Major students are required to take the following courses: Recreation Leadership 51, 52, 74, 77, 79, 80; Education 66; Psychology 62, and 93 or 94; Sociology 51, and one of the following: Sociology 52, 53, 56, 57, 68, 75. Two summers of leadership experience are required, without course credit: one summer should be in an organized camp and the other on a playground or in an institutional program. Each major student should have a working knowledge and some skill in each of the following: arts and crafts, music, dramatics, nature, sports, social recreation, public speaking, and first aid and safety.

Sophomores should elect Psychology 26, Sociology 25, and Government 25. Economics 25 and Philosophy 25 are recommended.

Romance Languages

S. C. Goding, *French Adviser*
J. M. Ferrigno, S. F. Wexler, *Spanish Advisers*

Two majors are offered: French and Spanish. The courses in these curricula are intended to give rounded and practical knowl-

edge of the languages for the purpose of wider reading, research, and oral communication, leading to a better understanding of all aspects of the intellectual, spiritual, and material attainments of the nations concerned.

Students majoring in French or Spanish are required to complete at least 30 approved junior-senior credits, six of which may be in English or another foreign language.

Sociology

J. H. KORSON, *Adviser*

The courses in sociology are planned with two aims in view:

(1) To give the student an understanding of the factors which influence men in their activities and interests as members of society, and

(2) To prepare those students who are interested in teaching at the elementary or high school level; or those students interested in careers with government agencies; or in careers as social workers with state or private agencies to gain the pre-professional courses necessary before embarking on such careers. Some agencies require work on the graduate level before full-time employment is obtained, while others offer in-training opportunities to graduate majors in sociology. Programs for students interested in teaching are prepared in cooperation with the Education department.

All major students are required to take Economics 25 and Psychology 26. At least 24 junior-senior credits in sociology are required. Students are required to take Sociology 53 and 82 and are urged also to select courses in economics, history, government, psychology, and as many in the humanities as possible.

Social Work

J. H. KORSON, *Adviser*

The American Association of Schools of Social Work indicates that the pre-professional subjects most closely related to professional work in this field are economics, political science, psychology, and sociology. The Association recommends that prospective students of social work or social administration take not fewer than 12 semester hours in one of these subjects while taking less in others. It also recognizes the value of courses in biology, history, English, as well as other subjects contributing to a broad cultural background for the student.

Speech

A. E. NIEDECK, *Adviser*

The program in speech is planned to serve the students in the entire university who wish training in oral communication, and to provide an opportunity for students in the College of Arts and Science to major in speech. Areas of specialization within the

major include Rhetoric and Public Address, Oral Interpretation, Theater, Radio and Television. All students planning to major in speech should elect Psychology 26 in their sophomore year. Required electives in other departments during the junior or senior year include English 55 and 68, and Philosophy 82.

Zoology

G. L. Woodside, *Adviser*

The courses in zoology have two major aims: (1) to offer students an opportunity to develop an understanding and appreciation of the scientific method as a part of a liberal education; and (2) to provide training for prospective graduate students in biology, medicine, dentistry, and related fields, as well as future teachers and laboratory technicians in the biological sciences.

The following courses are required of Zoology majors other than those planning to teach in high school: Zoology 1, 71, 72; Chemistry 1, 2, 29, 30, 33 (or 51, 52); Physics 25, 26; a minimum of one from: Zoology 69, 70, 74, and Invertebrate Zoology at Woods Hole; a minimum of one from: Zoology 51, 53; a minimum of two from: Zoology 35, 83, 84.

The following courses are required of Zoology majors planning to teach in high school: Zoology 1, 25, 35; Botany 1, 25, 26; Chemistry 1, 2, 33; Physics 25, 26; Education 51 (junior year); concentrated semester block, Education 52, 85, 88 (senior year); Psychology 56; any fifteen junior-senior credits in Zoology as recommended by the special departmental adviser (especially recommended: Zoology 53, 54, 55, 56, 70, 74, 80 and 81); additional science credits, if desired, recommended from: Entomology 26, Bacteriology 31, Geology 28, Wildlife Management 27, Botany 81, Entomology 79, 90.

COLLEGE OF AGRICULTURE

DALE H. SIELING, *Dean*

The College of Agriculture with its several departments offers a broad general education with specific training in some phase of agriculture or horticulture. Upon the completion of the requirements for graduation, the student will have devoted about one-quarter of his time to pure science, one-quarter to social and humanistic studies, and about one-half to applied science and technology in agriculture and horticulture.

A broad choice of electives within the required courses of each curriculum gives the student the opportunity to prepare for (1) actual agricultural production; (2) research, teaching, or extension work; or (3) industrial work.

Each department of the school has specific requirements for graduation which are included in the descriptive matter under the name of the department. To prevent overspecialization, each student is required to elect at least 12 junior-senior credits in some other school of the University, one-half of these credits to be in the humanities and social sciences.

During the first semester of the freshman year, students interested in teaching vocational agriculture, extension work, or specializing in research work, should consult with the head of the department in which they plan to major.

The School comprises the following departments: Agricultural Economics and Farm Management, Agricultural Engineering, Agronomy, Dairy and Animal Science, Floriculture, Food Technology, Forestry and Wildlife Management, Landscape Architecture, Olericulture, Pomology, Poultry Science, and Veterinary Science. Students may major in any of these departments except Veterinary Science and Agricultural Engineering.

Curricula in Agriculture

All students will take the following uniform curriculum during the first two years:

FRESHMAN YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
[1]Mathematics 7, Algebra and Trigonometry	3	[1]Mathematics 8 or 10	3
[2]Chemistry 1, General	3	[2]Chemistry 2, General	3
Botany 1, General	3	Zoology 1, General	3
Military 1 (men)	3	[3]Elective	3
Agriculture 1	3	Military 2 (men)	2
Physical Education 3 (men)	1	Physical Education 4 (men)	1
Physical Education 7 (women)	2	Physical Education 8 (women)	2

[1] Candidates for the Bachelor of Vocational Agriculture degree will take Government 25 and 26 in place of Mathematics.

Students who expect to take Calculus in the sophomore year should elect Mathematics 10.

[2] Those intending to major in Landscape Architecture and Ornamental Horticulture will take Chemistry 1 the first semester and Botany 1 the second semester. They may substitute a foreign language or History 5 and 6 for Zoology 1 and Chemistry 2.

[3] Students intending to major in Agricultural Economics, Floriculture, Food Management, Food Technology, Landscape Architecture and Ornamental Horticulture, Olericulture, and Pomology will take Horticulture 2. Animal Husbandry and Dairy Technology majors will take Animal Husbandry 2. Forestry majors will take Forestry 26. Wildlife Management majors will take a year of foreign language in place of Agriculture 1 and Forestry 26. Students undecided as to major as well as those majoring in Agronomy and Poultry Husbandry will take History 6.

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25, Humane Letters	3	English 26, Humane Letters	3
Econ. 25, Psych. 26 or Soc. 25	3	Econ. 25, Psych. 26 or Soc. 25	3
[1]A Science	3-4	[1]A Science	3-4
[2]Electives	6	[2]Electives	6
Military 25 (men)	2	Military 26 (men)	2
Physical Education 27 (women)	2	Physical Education 28 (women)	2
Physical Education 33 (men)	1	Physical Education 34 (men)	1

[1] To be selected from the following:

Bacteriology, 31
Botany 25, 26, 28, 30
Chemistry 29, 30, 33
Geology 1, 28
Mathematics 29, 30
Physics 25, 26
Zoology 25, 35
Entomology 26
Civil Engineering 27

[2] The student will be guided in his selections by his major adviser.

JUNIOR-SENIOR CURRICULA

At the end of the sophomore year each student selects one of the following curricula as his major to complete his collegiate training.

Agricultural Economics and Farm Management

A. H. LINDSEY, *Adviser*

The department offers two curricula, one in Agricultural Economics and one in Farm Management, which have been designed to give the student a broad knowledge of the agricultural industry. Production economics, marketing and agricultural business management are the three main fields of study. Associated with these are training in farm policy, credit, cooperatives and land economics.

A student majoring in this department is prepared for positions with those industries and agencies which serve agriculture; vocational and extension teaching and government service; service or research positions in marketing, credit, or resource use. Agricultural Economics majors may specialize in four fields of study: animal products; fruits and vegetables; feeds and fertilizers; lumber merchandising. The major adviser will suggest supporting courses in these fields. The farm management curriculum stresses the economics of production and trains for managerial advisory work as well as for actual operation of farms.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Ag. Econ. 55, Mark'g Farm Products	3	Ag. Econ. 56, Prin. of Coop.	3
Ag. Econ. 57, Agric. Credit	3	[1]Statistics 79, Elementary	3
Accounting 25, Elements	3	Bus Law 70	3
[1]Electives	6	Electives	6

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Ag. Econ. 89, Agric. Policy	2	Ag. Econ. 78, Land Econ.	3
Ag. Econ. 71, Ag. Econ. Theory	3	[1]Ag. Econ. 90, Agr. Institutions	2
Farm Management 75	3	Farm Management 76	2
[1]Electives	9	Electives	9

[1] Farm Management majors take Agronomy 51 in place of one elective junior year and Animal Husbandry 51 in place of one elective senior year. They take Agronomy 78 in place of Statistics 79 and Farm Management 84 in place of Agricultural Economics 90.

Agricultural Engineering

The department offers various courses in support of the various fields of agriculture. Those wishing major work in this field may get it under an option in the School of Engineering (page 113).

Agronomy

W. G. COLBY, *Adviser*

The courses are designed to give instruction concerning the basic knowledge of the soil and its management, fertilizers, and

their uses as related to the principal products of the field. Crop improvement practices and the science of crop improvement are stressed for those who are interested in agronomy as a specialty.

There is sufficient flexibility within the curriculum to allow the student to specialize in soil science, plant science, soil conservation or general agronomy. Those students who have a desire to receive training which will qualify them for investigational work in these fields may obtain it by selecting appropriate supporting science or vocational subjects as electives. This training equips them to serve as specialists in one of these selected fields for industrial corporations and may serve also as training for extension or teaching work.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Agron. 57, Soil Formation	3	Agron. 58, Soil Utilization	3
Zoology 53, Genetics	3	Electives	9
Electives	6		

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Agron. 51, Field Crops	3	Agron, 78, Fertilizer and Soil Fertility	3
Chem. 51, Organic	4	Chem. 52, Organic	4
Electives	9	Electives	9

Animal Husbandry

D. J. HANKINSON, *Adviser*

The animal husbandry curriculum is designed to provide the student with fundamental training in the physiology, breeding, nutrition, selection and management of farm animals. The curriculum is made flexible by permitting specialization in optional fields which prepare the student for positions in dairy cattle production and livestock production. An option is also available for those desirous of adequately preparing themselves for graduate work in animal science, including such specialized areas as animal nutrition, physiology or breeding.

Students who major in animal husbandry are required to take Animal Husbandry 51, 52, 65, 66, and Zoology 53 during junior year and Animal Husbandry 81 and 82 during senior year. They also must successfully complete one summer of Placement training before graduation, as well as the courses listed for one of the specialized fields of study below:

Dairy Production. Required courses: Agronomy 22, Animal Husbandry 26, 77, 78, Veterinary Science 75, 76; Dairy 25. Recommended: Animal Husbandry 33, Agronomy 52; Animal Husbandry 56 or 79; Agricultural Economics 75, 76.

Livestock Production. Required courses: Agronomy 22, Animal Husbandry 33, 56, 58, 79; Veterinary Science 75, 76. Recommended: Dairy 25; Agronomy 52; Animal Husbandry 77 or 78; Agricultural Economics 75, 76.

Animal Science. Required courses: Statistics 77; Math. 29, 30; Physics 25, 26; Zoology 87; two from Animal Husbandry 56, 77, 78, 79; one sequence of Chemistry 29, 30, 51, 52, 93, 94, or Chemistry 33, 79 and Zoology 71, 72.

Dairy Technology

D. J. HANKINSON, *Adviser*

Major students in dairy technology receive training in the testing, handling, and processing of milk, ice cream, butter, cheese, and other milk products. Practical application is made of chemistry, bacteriology, economics, and engineering in the many phases of dairy work.

Dairy technology graduates may secure responsible positions with commercial dairy manufacturing firms, or with equipment and supply firms. Opportunities are offered also for positions as teachers in high schools and colleges, for service in the fields of extension and research, and for sanitation and public health work with city, state or federal agencies.

Major students in dairy technology must successfully complete one summer of placement training in a dairy plant. It is recommended that this requirement be met during the summer immediately following the sophomore year of University residence.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Dairy 77, Butter and Cheese	4	Dairy 50, Judging	1
Chem. 51, Organic	4	Dairy 52, Mkt. Milk	4
Bact. 61, Public Health	3	Chem. 52, Organic	4
Electives	6	Electives	6

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Dairy 75, Chemistry	3	Dairy 78, Ice Cream	4
Daily 79, Seminar	1	Dairy 80, Seminar	1
Bact. 81, Applied	3	Bact. 90, Sanitary	3
Agr. Engin. 80 Food Process Eng.	3	Electives	9
Electives	6		

Fisheries Technology

C. R. FELLERS, *Adviser*

An optional curriculum in fisheries technology has been prepared by the Food Technology department. Excellent opportunities exist for employment by Federal, State, and private industry in this rapidly expanding field.

Students taking this curriculum will follow the regular Food Technology curriculum with certain substitutions and additions. The department head should be consulted before the student begins his second year.

Floriculture

C. L. THAYER, *Adviser*

The courses in floriculture provide for a comprehensive and detailed study of the practices and principles involved in the production, marketing and uses of cut flowers, flowering and foliage plants grown outdoors and under glass. Opportunities available to graduates may include: positions in various fields of commercial floriculture, such as production, wholesale marketing and retailing; employment in nurseries, on private estates and in conservatories; positions in the professional field, including graduate study, teaching in colleges and secondary schools, research and extension work under state, Federal, or other supervision.

It is advantageous for the student to determine, as soon as possible, the type of position for which he wishes to fit himself since the choice of elective courses will depend largely on his decision.

All major students in floriculture must successfully complete one summer of placement training in work related to their major objective and approved by the head of the department. It is recommended that this requirement for graduation be met during the summer following the freshman or sophomore year.

As sophomores majors are advised to take Chemistry 29 and Botany 26 for their sciences. First semester electives should be Botany 25 and Olericulture 25; second semester Entomology 26 and Floriculture 26.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Flori. 51, Greenhouse Mgt.	3	Flori. 52, Flower Arrangement	3
Flori. 79, Conservatory Plants or	2	Flori. 54, Greenhouse Const.	3
Flori. 81, Gardens and Borders	3	Plant Breeding 52, Methods	3
Zoology 53, Prin. of Genetics	3	Botany 52, Advanced Plant Pathology	3
Entomology 51, Pests of Special Crops	3	Electives	3
Botany 51, Plant Pathology	3		
Electives	2-3		

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Flori. 75, Commercial	3	Flori. 76, Commercial	3
Flori. 79 or	2	Flori. 82, Seminar	3
Flori. 81	3	Botany 68, Physiology	3
Botany 67, Physiology	3	Electives	8
Electives	5-9		

Food Management

C. R. FELLERS, *Adviser*

The curriculum in food management is offered as an option in the Food Technology department. The program is designed to give the student a general well-rounded background of arts and sciences, coupled with training in subjects useful to the hotel and restaurant industries. The nature of the food service industry requires persons with broad, general backgrounds of business training coupled with a scientific knowledge of foods.

In the sophomore year food management majors should take Food Management 33, Chemistry 33, and Accounting 25 the first semester and Home Economics 30, Bacteriology 31, and Accounting 26 the second semester.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Food Mgt. 67, Food Prep. & Serv.	3	Food Mgt. 68, Kitchen Adm.	3
Food Tech. 51, Introductory	3	Food Tech. 52, Food Prod.	3
*Dairy 25, General	3	Home Ec. 52, Nutrition & Diet	3
†Electives	6	Accounting 64, Cost Acct.	3
		An Hus. 54, Meat Processing	2
		†Elective	2-3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Food Tech. 71, Food Sci. Lit.	2	Food Tech. 72, Food Sci. Lit.	2
Food Mgt. 77, Food Service Prac.	3	Food Mgt. 78, Stewarding	3
Home Ec. 91, Quant. Food Prep. & Institutional Mgt.	3	Ind. Adm. 64, Personnel Mgt.	3
Poult. 75, Marketing Poult. Prod.	2	Bus. Law 70, Bus. Law I	3
†Electives	5	†Electives	4

† Suggested electives:

Dairy 52, 78
Economics 79
Finance 65
Home Economics 62
Speech 91
Journalism 85
Marketing 54
Olericulture 74
Public Health 61, 63

* An additional elective may be substituted for Dairy 25.

Food Technology

C. R. FELLERS, *Adviser*

The department of food technology offers three curricula: Fisheries Technology (page 89), Food Management (page 91), and Food Technology.

The curriculum in food technology provides scientific and applied training in the principles concerned with the processing, preservation, and packaging of foods and food products. Both home and commercial methods of food preservation are considered. Practical work includes canning, freezing, dehydration, fermentation and salting. Methods of manufacture of jams, jellies, fruit

juicies, and beverages are a part of the course work. An effort is made to apply the student's background in chemistry, physics, and bacteriology to food technology problems and food analysis.

The curriculum gives the student a broad science background with specialized knowledge in food processing and preservation. Special courses are offered for home economics majors who plan to teach or do extension work in foods. Major fields open to graduates include: (1) commercial work in cannery, freezer and other plant operations; (2) control and analytical work related to food products; (3) government food inspection and grading; (4) technological work in government and industry.

Ambitious students are encouraged to acquire the background which will enable them to pursue graduate work and research in the application of scientific knowledge to the technology of foods.

The selection of supporting courses depends upon the objective of the student, which should be determined as early as possible.

Food technology majors should take Physics 25 and 26 and Chemistry 29 and 30 in the sophomore year; also, if possible, Bacteriology 31. Students planning to take Physical Chemistry should complete Mathematics 29 and 30.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Food Tech. 51, Introductory	3	Food Tech. 52, Food Prod.	3
Chemistry 51, Organic	4	Chemistry 52, Organic	4
Bacteriology 51	3	Bacteriology 82, Applied	3
Agr. Engin. 80, Food Eng.	3	Agr. Engin. 82, Refrigeration	2
Elective		Electives	

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Food Tech. 61, Industrial Technology	3	Food Tech. 62, Industrial Technology	3
Food Tech. 71, Food Science Literature	2	Food Tech. 72, Food Science Literature	2
Food Tech. 91, Analysis of Food Prod.	3	Food Tech. 92, Anal. Meth. & Instrumentation	3
Chemistry 79, Elem. Biol. or	4	Food Tech. 98, Sensory Evaluation Meth.	2
Chemistry 65, Physical	3	Chemistry 65, Physical	3
Electives		Electives	

SUGGESTED JUNIOR-SENIOR ELECTIVES

Public Health 61, 62, 63
A Foreign Language
Mechanical Engin. 1, 63
Pomology 77
Dairy 75, 77, 52 or 78
Animal Husbandry 53
Poult. Husbandry 75
Olericulture 73, 74
Botany 66
Home Ec. 30, 52, 54
Food Tech. 85, 96
Chem. Engin. 77, 75
Indus. Engin. 25, 51

Forestry

A. D. Rhodes, *Adviser*

The technical curriculum in forestry is concentrated in the field of forest production and management, and leads to the degree of Bachelor of Science. It has professional status, being accredited by the Society of American Foresters.

The freshman and sophomore years are devoted to studies of basic sciences, English, and other subjects of cultural-foundational value. A required group of three courses—forest mensuration, forest harvesting, and plane surveying—is presented in a nine-weeks summer term immediately following the freshman year. Following the sophomore year qualified students are encouraged to undertake summer work giving practical field experience in forestry. Such employment may be with the United States Forest Service or other public and private agencies.

Ten technical courses in forestry are grouped in the junior and senior years in addition to three supporting courses presented by other departments, a required course in history, and six electives. It is intended that the forestry curriculum be as sound professionally and as broad from the viewpoint of general education as is possible within the limits of four undergraduate years.

The forestry courses are open with few exceptions to students other than those concentrating in forestry but should be elected only after consultation with the student's major adviser and with the instructor teaching the course.

Sophomore majors in forestry take Forestry 25, Physics 25 and Geology 61 the first semester; Entomology 26, Physics 26, Botany 28 and Agronomy 22 the second semester.

SUMMER (Following Freshman Year)

Forestry 55, Forest Mensuration	Credit, 3
Forestry 78, Forest Harvesting	Credit, 3
Civil Engineering 27, Plane Surveying	Credit, 3

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Forestry 53, Silvics	3	Forestry 56, Prin. of Silviculture	3
Forestry 59, Protection	3	Forestry 54, Forest Soils	3
Forestry 75, Products	3	Entomology 72, Forest Ent.	3
History	3	Elective (not Forestry)	6
Elective (not Forestry)	3		

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Forestry 81, Regional Silvicul.	3	Forestry 82, Seeding and Planting	3
Forestry 57, Forest Policy & Econ.	3	Forestry 80, Forest Mgt.	3
Forestry 71, Photogrammetry	3	Wildlife Mgt. 72, Forest-Animal Relationships	3
Botany 51, Plant Pathology	3	Electives (not Forestry)	6
Electives (not Forestry)	3		

Landscape Architecture

R. H. Otto, *Adviser*

Instruction in this department has two objectives: first a contribution to general education; second, a preparation of students for the practice of landscape architecture. The department offers optional curricula, (1) Professional Landscape Architecture, and (2) Ornamental Horticulture.

The department also offers several elective courses in art (listed and described under Directory of Courses, page 132, which do not constitute a major. These courses are primarily cultural rather than technical and are intended to provide a better appreciation of the arts.

Students following this curriculum are prepared to take up work in landscape architecture, which leads through field experience or post-graduate study to permanent establishment in the profession.

Sophomores in the first semester elect either Botany 25 or Geology 1 for their science and take Landscape Architecture 25 and Civil Engineering 27 as electives. In the second semester the science is either Entomology 26 or Geology 28 and the electives Landscape Architecture 26 and Horticulture 26.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Land. Arch. 51, Topography	3	Land. Arch. 52, Construction Design	3
Land. Arch. 53, Intro. Design	3	Land. Arch. 54, Gen. Design	3
Hort. 51, Plant Materials	3	Land. Arch. 86, City Plan.	3
Land. Arch. 79, Const. & Maint. alternates with Land. Ach. 83, Architecture	3	Hort. 52, Planting Design	3
Elective	3	Electives	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Land. Arch. 81, Adv. Design	3	Land. Arch. 88, Projects in Plan.	3
Land. Arch. 87, Projects in Plan.	3	Land. Arch. 82, Advanced Design	3
Land. Arch. 83, alternates with Land. Arch. 79	3	Land. Arch. 80, His. & Lit. of Land. Arch.	2
Electives	6	Electives	7

SUGGESTED ELECTIVES FOR JUNIOR AND SENIOR YEARS

Agrostology 53, 56
Civil Engin. 90
Agri. Engin. 51
Sociology 51
Floriculture 81
Philosophy 82
Art 33, 34, 75, 78
Land. Arch. 84

Olericulture

G. B. Snyder, *Adviser*

The courses in olericulture provide a basic training in the scientific principles and applied practices relative to the culture and marketing of vegetable crops. The major courses prepare students

for the operation of commercial vegetable farms; for high school, college, and federal work in teaching, research and extension; for state, federal and private produce inspection work; for various opportunities in the retail and wholesale marketing of perishables; and as service men, specialists, and managers in industrial fields allied to the vegetable industry.

The rather broad objectives of the training means that the selection of supporting courses depends upon the specific field in which the student wishes to engage on graduation. This objective should, therefore, be determined as early as possible during the sophomore year.

Majors in olericulture should take the following courses during the first semester of the sophomore year: Botany 25 or Geology 1 and Olericulture 25. In the second semester they should include Chemistry 29, Entomology 26, and Pomology 26.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Oleri. 51, Nutr. of Veg. Crops	3	Oleri, 52, Comm. Veg. Prod.	3
Zoology 53, Genetics	3	Botany 68, Plant Physiology	3
Botany 51, Plant Pathology	3	*Electives	9-11
Botany 67, Plant Physiology	3		
*Electives	5		

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Oleri. 73, Prod. Marketing Practices	3	Oleri. 74, Merchandising of Perishables	3
Oleri, 75, Systematic	4	Oleri. 80, Sp. Problems	3
Entomology 51, Pests of Special Crops	3	*Electives	9-11
*Electives	5-7		

* Suggested electives:

Agric. Ec. 55, 75, 76
Agron. 78
Botany 58
Bacteriology 56
Chem. 33, 79
Plant Breed. 52
Agric. Engin. 72, 82
Flori. 54
Food Tech. 51, 75

Ornamental Horticulture

The curriculum in ornamental horticulture offered by the department of landscape architecture is suggested for those preferring to follow the horticultural phase of landscape including (1) nursery practice; (2) landscape planting and construction; and (3) maintenance of landscaped areas, such as parks and semi-public institution grounds.

Sophomores in this major will take Botany 25, Civil Engineering 27, Landscape Architecture 25 in the first semester; Entomology 26, Floriculture 26, and Horticulture 26 in the second.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Hort. 51, Plant Materials	3	Hort. 52, Planting Design	3
Land. Arch 51, Topography	3	Land. Arch. 52, Constr. Details	3
Land. Arch. 53, Intro. Design	3	Pomology 26, Small Fruits	3
Landscape Arch. 79, Constr. & Maint.	3	Land. Arch. 54, Gen. Design	3
Elective	3	Elective	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Flori. 81, Herbaceous Borders	3	Agrostology 56, Turf Mgt.	3
Agrostology 53, Turf Grasses	3	Pomology 56, Orchard Pest Control	3
Zoology 53, Genetics	3	Plant Breeding 52, Methods	3
Ent. 51, Pests of Sp. Crops	3	Electives	6
Botany 51, Plant Pathology	3		

SUGGESTED ELECTIVES FOR JUNIOR AND SENIOR YEARS

Botany 67, 68, 81
Entomology 72
Agronomy 78
Forestry 56

Pomology

A. P. French, *Adviser*

The pomology courses provide a comprehensive training in the scientific and commercial principles concerned in the growing and marketing of apples, pears, peaches, plums, cherries, and small fruits. Major fields open to graduates include: (1) practical work in connection with the operation of fruit farms; (2) teaching in college, high school, or secondary schools of agriculture; (3) extension work in county, state, or nation; (4) research work with state, federal or private concerns; and (5) commercial work in connection with the manufacture and sale of such supplies as machinery, packages, and spraying and dusting materials. Certain supporting courses are required and their selection depends upon the objective of the student. That objective should, therefore, be determined as early as possible.

An optional curriculum in cranberry technology is offered by the department and is designed to provide a broad training in the fields of knowledge which serve as the foundation of the cranberry industry. Its purpose is to provide future leaders and specialists for the industry.

Sophomores are advised to elect Geology 1, Chemistry 29, and Pomology 25 in the first semester; in the second semester they should take Agronomy 22, Entomology 26, and Pomology 26.

Two separate curricula are offered during junior and senior year: one for pomology majors and one for majors in cranberry technology.

Pomology majors follow the curriculum outlined below. The student who wishes to do college teaching, extension work, or re-

search is advised to secure a broad foundation in science and liberal arts, and to plan to enter a graduate school sooner or later. The student whose objective is growing fruit or teaching in a secondary school may need to broaden his training in horticulture and agriculture and will need also all the science and liberal arts courses that can be included in the program. Students majoring in Pomology must successfully complete one summer of placement training on a fruit farm before the beginning of the senior year.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Pomology 79 or 81, Advanced	3	Pomology 56, Orchard Pest Control	3
Pomology 75, Systematic or	4	Botany 68, Psychology	3
Pomology 77, Fruit Mktg.	3	Botany 30, Plant Anatomy	3
Botany 51, Plant Pathology	3	Electives	6
Botany 67, Physiology	3		
Elective	3		

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Pomology 79 or 81, Advanced	3	Pomology 84, Problems	3
Pomology 75, Systematic or	4	Olericulture 74, Merch. of Perish.	3
Pomology 77, Fruit Mktg.	3	Electives	12
Zoology 53, Genetics	3		
Chemistry 33 or 51	4		
Electives	3		

Majors in cranberry technology will take the following curriculum. They also must satisfactorily complete a minimum of two summers' practical experience in the cranberry industry before the beginning of the senior year.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Chem. 33	3	Pomology 56, Spraying	3
Botany 51, Plant Pathology	3	Ag. Econ. 26, Ag'l Prod.	3
Ent. 51, Pests of Special Crops	3	Electives	
Electives			

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Bot. 67, Plant Psychology	3	Bot. 68, Plant Physiol.	3
Ag. Econ. 55, Marketing	3	Ag. Econ. 56, Cooperation	3
Pom. 85, Cranberry Prob.	2	Pom. 86, Cranberry Prob.	2
Electives		Electives	

Poultry Husbandry

T. W. Fox, *Adviser*

The department gives instruction in the science, art and practices of poultry keeping, not only to students specializing in this department, but also to those in other departments who desire supporting work in poultry husbandry. The major courses prepare

men for the successful operation of commercial poultry and breeding farms and hatcheries either as owners or managers; for high school, college and federal work in teaching, extension and research; and as service men, specialists and managers in industrial fields allied to the poultry industry.

Students must successfully complete one summer of placement training on a poultry farm or in some business allied to poultry.

Sophomores may choose electives from the list of sophomore sciences or Dairy 25, Animal Husbandry 26, Agricultural Economics 26, Olericulture 25, Pomology 26, Floriculture 26, or Wildlife Management 27.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Poultry Husb. 55, Housing and Sanitation	2	Poultry Husb. 52, Incubation and Brooding	3
Poultry Husb. 53, Judging	3	Poultry Husb. 56, Nutrition	3
Zoology 53	3	Electives	
Electives			

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Poultry Husb. 75, Marketing	2	Poultry Husb. 78, Seminar and Farm Management	3-4
Poultry Husb. 77, Breeding	3	Poultry Husb. 76, Turkey Prod.	2
Vet. Sci. 75, Comp. Vet. Anat	3	Vet. Sci. 88, Avian Path.	3
Electives		Electives	

Veterinary Science

Though major work in Veterinary Science is not available, the department does offer supporting courses to assist students who expect to enter the various fields of agriculture, wildlife management, public health, teaching and laboratory work in the biological sciences or veterinary medicine.

Wildlife Management

R. E. Trippensee, *Adviser*

The courses in conservation and wildlife management offered by the department of forestry and wildlife management are designed for those who desire a general understanding of the renewable natural resources as well as those who expect to make a living in the professional field of wildlife management. Courses are available also to students who expect to major in other fields including agriculture, agronomy, economics, forestry, entomology, and education.

Wildlife management is both an applied science and an art and is concerned with the production and control of animal populations on many types of land including farms, forests, and on waste lands and water areas. Thus an understanding of both the

origin and management of land and water is necessary. These background phases include geology, agronomy, forestry, and agriculture. Fields of specialization include fisheries management, game, and furbearer management and control of injurious animals, and related fields such as soil conservation, conservation education, and industrial biology.

Studies in wildlife management are closely correlated with the work of the State Conservation Department and the U. S. Fish and Wildlife Service. During the junior and senior years trips are planned to the bait-mixing station of the U. S. Fish and Wildlife Service, the John C. Phillips Wildlife Laboratory at Upton, Mass. and to numerous wildlife projects in the state. Students are urged to attend the northeastern and the American wildlife conferences.

Graduates in this field are eligible to both state and federal civil service examinations, and most of the permanent job opportunities are in public service either with the state or federal government. A limited number of positions are open in private enterprises. Training in the wildlife field is an excellent background for teaching of science in the public schools and for employment as conservation officers. Much research data and many research operations are available to undergraduates through the Massachusetts Cooperative Wildlife Research Station, and students with sufficiently high grades are eligible for graduate work at other universities.

The courses during the first two years are basic educational subjects required to build a background of sound professional training. Sophomores are expected to take Geology 1, Zoology 35, Wildlife Management 27, Agronomy 22, Entomology 26, and Forestry 26. During junior and senior years major students take Wildlife Management 70, 71, 74, 75 and 84; Government 25; Forestry 55, 56; and Botany 53.

SCHOOL OF BUSINESS ADMINISTRATION

MILO KIMBALL, *Dean*

The School of Business Administration prepares students eventually to assume positions of responsibility in business. An objective of the School is the education of young men and women who will regard management in business as a profession with high ethical standards and broad social responsibilities. The curricula provide preparation for specialized tasks in accounting, finance, industrial management, insurance, marketing, merchandising, office management or personnel management. When specialization is not desired, the student selects the General Business Managment program. Each course of study leads to the professional degree of Bachelor of Business Administration.

Curricula in Business Administration

In keeping with the objectives of the School, the study programs encourage breadth of training for business. General education is emphasized by providing fundamental courses in the humanities, mathematics, science, and social studies. The courses for the first two years are therefore largely prescribed.

FRESHMAN YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Industrial Adm. 11, Indust. Geography or Foreign Language	3	Economics 12, Ec. Hist of U. S. or Foreign Language	3
Mathematics 1, 5, or 7	3	Mathematics 2, 4, 6, 8, or 10	3
Government 25, American	3	History 6, Mod. European Civ.	3
Elective, Science	3	Elective, Science	3
Military 1	3	Military 2	2
Physical Ed. 7 (women)	2	Physical Ed. 8 (women)	2
Physical Ed. 3 (men)	1	Physical Ed. 4 (men)	1

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25, Humane Letters	3	English 26, Humane Letters	3
Economics 25, Elements	3	Economics 26, Prob. of Nat'l Economy	3
Accounting 25, Introduction to	3	Accounting 26, Introduction II	3
Psychology 26, General	3	Sociology 25, Introduction to	3
Elective	3	Elective	3
Military 25	2	Military 26	2
Physical Ed. 33 (men)	1	Physical Ed. 34 (men)	1
Physical Ed. 27 (women)	2	Physical Ed. 28 (women)	2

JUNIOR-SENIOR CURRICULA IN BUSINESS ADMINISTRATION

The channels to specialization in a particular area of business lead through basic courses in production, marketing, finance, accounting, statistics, business law, and administration. The junior-senior programs are based on this core. Students thus acquire an awareness of each of the fundamental functions of business and develop facility in the use of the basic tools of management. They develop understanding of the relationship of their particular interest to all business activities as well as competence in a special field.

General Business Management

This program is given for students whose interest is in general management in business. It is designed to provide understanding of the broad administrative aspects of business, and specialized courses are subordinated to a comprehensive program of training.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
I. A. 63, Mgt. in Industry	3	Fin. 65, Corporation Finance	3
Mkt. 53, Marketing Principles	3	Fin. 76, Insurance	3
Fin. 55, Financial Institutions	3	I. A. 66, Transporation & Traffic	3
Stat. 79, Elem. Ec. Stat.	3	Ec. 56, Business Fluctuations	3
Elective	3	Elective	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Bus. Law 70, Bus. Law I	3	Bus. Law 72, Bus. Law II	3
Ec. 73, Modern Econ. Theory	3	I. A. 80, Adm. Procedure	3
Ec. 79, Labor Problems	3	Ec. 78, Public Finance	3
Elective in Business	3	Elective in Business	3
Elective	3	Elective	3

Accounting

Accounting deals with the problems of measuring, recording, reporting and interpreting business transactions. This program is for the student who wishes to prepare for employment as auditor, controller, cost analyst, industrial accountant, public accountant, or teacher of accounting.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Acct. 61, Intermediate Accounting	3	Acct. 62, Advanced Accounting	3
Fin. 55, Financial Institutions	3	Acct. 64, Cost Accounting	3
Statistics 79, Elem. Ec. Stat.	3	Bus. Law 70, Bus. Law I	3
Mkt. 53, Marketing Principles	3	Fin. 65, Corporation Finance	3
Elective	3	Elective	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Acct. 73, Fed. Income Tax Procedure	3	Acct. 74, Adv. Acct. Problems	3
Acct. 75, Adm. Accounting & Control	3	Acct. 76, Auditing	3
I. A. 63, Management in Industry	3	Fin. 82, Investments	3
Ec. 73, Modern Ec. Theory	3	Ec. 78, Public Finance	3
Elective	3	Elective	3

Finance

Courses in banking, finance and insurance are provided for students who expect to assume responsibility for financing a business or to work for banks, investment institutions, brokerage houses, insurance companies, or governmental agencies concerned with finance.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Fin. 55, Financial Institutions	3	Bus. Law 70, Business Law I	3
Fin. 65, Corporation Finance	3	Ec. 56, Business Fluctuations	3
I. A. 63, Management in Industry	3	Stat. 79, Elem. Ec. Stat.	3
Mkt. 53, Marketing Principles	3	Elective in Business	3
Elective	3	Elective	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Fin. 81, Problems of Bus. Finance	3	Fin. 76, Insurance	3
Ec. 73, Modern Economic Theory	3	Fin. 82, Investments	3
Ec. 79, Labor Problems	3	Ec. 78, Public Finance	3
Electives	6	Electives	6

Industrial Administration

Industry offers to qualified students an opportunity to find satisfying careers in industrial management, or personnel management. The program offered is designed to give the student specialized training in these fields and a comprehensive understanding of the problems of industrial enterprises.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
I. A. 63, Mgt. in Industry	3	I. A. 64, Personnel Management	3
Fin. 55, Financial Institutions	3	I. A. 66, Transportation & Traffic	3
Mkt. 53, Marketing Principles	3	Bus. Law 70, Bus. Law I	3
Stat. 79, Elem. Ec. Stat.	3	Acct. 64, Cost Accounting	3
Elective	3	Elective	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
I. A. 73, Problems in Industrial Management	3	I. A. 80, Administrative Procedure	3
Acct. 75, Administrative Accounting & Control	3	Mkt. 76, Purchasing	3
Fin. 65, Corporation Finance	3	Psych. 86, Industrial Psychology	3
Ec. 79, Labor Problems	3	I. E. 88, Motion & Time Study	3
Elective	3	Elective	3

Management Training

A curriculum in Management Training for young women has been approved and is being developed.

Marketing

Students in marketing prepare for a variety of occupations in wholesale and retail enterprises and the sales activities of manufacturers. The program offers specialized study of basic types of market operations.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Mktg. 53, Marketing Principles	3	Mktg. 54, Salesmanship & Sales Mgt.	3
Fin. 55, Financial Institutions	3	Mkgt. 62, Market Research	3
I. A. 63, Management in Industry	3	I. A. 66, Transportation & Traffic	3
Stat. 79 Elem. Ec. Statistics	3	Bus. Law 70, Bus. Law I	3
Elective	3	Elective	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Mkt. 71, Retail Merchandising	3	Mkt. 80, Problems in Mgt.	3
Mkt. 73, Advertising	3	Mkt. 76, Purchasing	3
Ec. 79, Labor Problems	3	Psych. 86, Industrial Psychology	3
Ec. 73, Modern Ec. Theory	3	Elective in Business	3
Elective	3	Elective	3

Merchandising

This program has been planned to meet the growing demand for women with technical training to fill positions of responsibility in retail merchandising.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Mkt. 53, Marketing Principles	3	Mkt. 62, Market Research	3
Ec. 55, Ec. of Consumption	3	I. A. 64, Personnel Management	3
Fin. 55, Financial Institutions	3	Home Ec. 4, Textiles	3
Elective in Business	3	Elective in Business	3
Elective	3	Elective	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Mkt. 71, Retail Merchandising	3	Mkt. 80, Marketing Problems	3
Mkt. 73, Advertising	3	B. L. 70, Business Law I	3
Home Ec. 35, Tailoring or Clothing Construction	3	H. Ec. 62, Home Furnishing	3
Elective in Business	3	Elective in Business	3
Elective	3	Electives	3

SCHOOL OF EDUCATION

A. W. Purvis, *Dean*

The School of Education through its undergraduate program seeks to utilize the forces of the University to prepare teachers for elementary and secondary schools and through its graduate offering to prepare administrators and specialists in public education. Its program is based upon the assumption that teachers and other school personnel should have a broad liberal education, considerable mastery of at least one field, and professional courses which should lead to a knowledge of the persons to be taught, familiarity with the problems to be met, and practice in the best techniques of teaching and supervision. In all of this the School of Education takes the position that teacher training is a University function and that success will come only if the School is successful in maintaining the closest possible relationships with other schools and departments that contribute to the program.

All students who contemplate teaching as a career should register early, in their freshman year if possible, with the School of Education although their courses in Education do not begin until the junior year. In general, students are admitted without question to the various service courses of the junior and senior years, but admission to the teacher-training program of the concentrated semester block is determined by a composite rating based on scholarship as shown by University grades (a three-year average at least as high as the University median is desired), success in the beginning courses in Education, recommendations of University teachers in general education fields, and personality ratings by members of the staff.

Elementary School Teaching

Candidates for this program may elect either a major or a minor in Education.

Students electing a major in Elementary Education take the following courses:

FRESHMAN YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 1	2	English 2	2
Speech 3	1	Speech 4	1
Math. 7 or 5	3 or 4	Math. 8, 10 or 6	3 or 4
Zool. 1 or Bot. 1	3	Bot. 1 or Zool. 1	3
Foreign Lang.	3	Foreign Lang.	3
History 5	3	History 6	3
Military 1 (men)		Military 2	
Phys. Ed. 3 (men)	1	Phys. Ed. 4 (men)	
Phys. Ed. 7 (women)	2	Phys. Ed. 8 (women)	2

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25	3	English 26	3
Psychology 26	3	Sociology 25 or Econ. 25	3
*Science	3 or 4	Zool. 54	3
Government 25	3	Music 51 or Art 78	3
*Elective	3	*Elective	3
Military 25 (men)		Military 26 (men)	
Physical Ed. 33 (men)	1	Physical Ed. 34 (men)	1
Physical Ed. 27 (women)	2	Physical Ed. 28 (women)	

* To be chosen from sophomore electives in the College of Arts and Science.

JUNIOR AND SENIOR YEARS

During junior year the student takes History 59 and 60, Education 51 and 64 and Psychology 94 (or Home Economics 70). One semester of senior year is devoted to the concentrated Elementary Block (Ed. 60, 61, 62, 85). Majors will be expected to utilize their junior and senior electives to develop a minor of at least fifteen hours in a general education field.

Students electing a minor in Elementary Education will satisfy the requirements of their major department so far as general education is concerned but they should plan to take the three professional prerequisite courses Education 51, 64, and Psychology 94 and the concentrated elementary block.

Secondary School Teaching

All candidates for secondary school teaching will major in the subject field to be taught and minor in Education. A maximum of eighteen hours should be taken in this minor. Education 51 and Psychology 56 are required during junior year and Education 52, 88, 85 (called the secondary block) in one semester of senior year. Since the concentrated semester block in secondary school teacher-training carries only twelve credits students should consult with their major adviser regarding means of making up the extra three credits, and of meeting all their major requirements in the three semesters of junior and senior years.

Special Field Programs for Prospective Teachers

In Agriculture (C. F. Oliver, adviser). By a cooperative agreement with the State Division of Vocational Education, persons otherwise qualified may prepare to teach vocational agriculture by the satisfactory completion of Education 72, 73, and 75. Education 52 is also recommended. To insure a desirable range of preparation, students who contemplate vocational teaching should consult, early in the freshman year, if possible, Professor Oliver and the State Supervisor of Agricultural Teacher-Training. A vocational teacher-training certificate is awarded by the Vocational Division to those who fully qualify.

In Home Economics (Miss Strattner, adviser). These students will major in Home Economics and minor in Education. They should elect Education 51, Psychology 56, Home Economics 81 and the concentrated semester block (Education 52, 85).

In Teacher Coaching (S. W. Kauffman, adviser). These students will major in Physical Education and minor in Education. They should elect Psychology 56 and the concentrated semester block (Education 52, 88, 85). They should elect a minor teaching field from the College of Arts and Science consisting of a minimum of eighteen hours.

In Music (D. Alviani, adviser). These students will major in Music and minor in Education. They should elect Education 51, Psychology 56, and the concentrated semester block (Education 52, 88, 85).

SCHOOL OF ENGINEERING

G. A. Marston, *Dean*

The departments of chemical engineering, civil engineering, mechanical engineering and electrical engineering comprise the School of Engineering. Each department offers a curriculum leading to a Bachelor of Science Degree in that particular branch. An optional curriculum in industrial engineering is offered in the mechanical engineering department.

The Civil, Electrical, Mechanical, and the Industrial optional curricula have been accredited by the Engineers Council for Professional Development.

Engineering can be defined as the combination of science and art by which materials and power are made useful to mankind. An engineer requires intensive technical training but at the same time he should acquire the broad education that distinguishes the professional man from the technician. His education does not end with formal schooling but continues throughout his life as he accumulates experience.

The curricula in engineering have been carefully prepared to offer each student the opportunity to acquire a sound training in the fundamental work of the various branches of his chosen field. At the same time he receives a thorough training in the sciences and mathematics, which are the important tools of the engineer. About twenty per cent of his time is devoted to the social and humanistic studies. Some opportunity to pursue his particular interest is offered in the senior year.

The curriculum of the freshman year is the same for all. Specialization to a limited extent begins in the sophomore year.

FRESHMAN YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English I, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Mathematics 5, Analytical Geom.	4	Mathematics 6, Diff. Calculus	4
Chem. 1, General	3	Chem. 2 or 4, General	3 or 4
Mechanical Engineering 1, Drawing	2	Mechanical Engr. 2, Drawing	3
*Hist. 5 or foreign language	3	*Hist. 6 or foreign language	3
Military 1	3	Military 2	2
Physical Ed. 3	1	Physical Ed. 4	1

* French or German recommended for Chem. Engin. majors.

SOPHOMORE-JUNIOR-SENIOR CURRICULA

Majors in Engineering will select one of the following curricula.

Chemical Engineering

E. E. LINDSEY, *Adviser*

Chemical Engineering is that branch of engineering concerned with the development of manufacturing processes in which chemical or certain physical changes of materials are involved. These processes may usually be resolved into a coordinated series of unit operations (physical changes) and unit processes (chemical changes). The work of the chemical engineer is primarily concerned with the design, construction, and operation of equipment and plants in which series of these unit operations and processes are applied. Chemistry, physics, and mathematics are the underlying sciences of chemical engineering, and economics is its guide in practice.

Chemical engineers are employed not only in these industries manufacturing chemicals but in many others where there occur chemical changes and physical changes other than forming and shaping which is the province of mechanical engineering. Examples are: petroleum refining, coal processing, refractories and clay products, cement, waste treatment, pulp and paper, rayon and textiles, paint and varnish, natural and synthetic rubber, foods, leather, plastics, soap, penicillin and other antibiotics. Much of the work of the atomic energy program is chemical engineering. The types of work done by chemical engineers include: design, construction, research, development, production, financial and patent appraisal, management, and sales.

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Chem. Engin. 25	2	Chem. 30, Quantitative Analy.	4
Chem. 29, Qualitative Analy.	4	Physics 28, General	4
Physics 27, General	4	Math. 32, Diff. Equations	4
Math. 31, Applied Calculus	4	English 26, Humane Letters	3
English 25, Humane Letters	3	Chem. Engin. 26, Calculations	2
Military 25	2	Military 26	2
Physical Education 33	1	Physical Education 34	1

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Chemistry 51, Organic	4	Chemistry 52, Organic	4
Chemistry 65, Physical	4	Chemistry 66, Physical	4
Civil Engin. 34, Statics	3	Civil Engin. 53, Strength of Mat.	3
Chem. Engin. 55, Unit Opera. I	5	Chem. Engin. 56, Unit Opera. II	5
[1]Economics 25, Elements	3	[1]Psych. 26 or Sociology 28	3

SUMMER (6 WEEKS)

Chem. Engin. 75, Instrumentation	3	Chem. Engin. 88, Chem. Engin. Lab.	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Chem. Engin. 81, Heat-Energy Rel.	3	Chem. Engin. 82, Ind. Equil. & Kinetics	3
Chem. Engin. 93, Comprehen. Prob.	3	Chem. Engin. 94, Comprehen. Prob.	3
Chem. Engin. 91, Seminar	1	Chem. Engin. 92, Seminar	1
Elec. Engin. 63, Elements	3	Elec. Engin. 64, Indus. Applic.	3
Chem. Eng. 89, Lab. Projects	3	[1]Electives	6
[1]Electives	6		

[1] Of the 12 elective credits, six must be in Liberal Arts courses and six from Engineering, Science, Honors Work, English 83, or Business Law 70, except for advanced military students who will defer Economics 25, Psychology 26 or Sociology 25 to senior year in place of two of their electives, and take advanced military courses as their 12 elective credits.

Civil Engineering

M. P. White, *Adviser*

Civil engineering is concerned with structures, transportation, movement of fluids, use and storage of water, sanitation, and surveying and mapping. A civil engineer may be engaged in research, in planning and designing, in construction, or in maintenance and operation. Consequently, civil engineering contains room for a wide range of interests—from highly theoretical to very practical.

The curriculum gives a thorough training in the fundamental sciences and at the same time prepares a student for work in any branch of civil engineering. During his senior year a student takes two or three elective technical courses, allowing him to specialize to some extent in whatever branch of civil engineering is most interesting to him — sanitation, mechanics and structures, hydraulics, foundation engineering, highway engineering.

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25, Humane Letters	3	English 26, Humane Letters	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Physics 27, General	4	Physics 28, General	4
Civ. Engin. 25, Surveying	5	Elec. Engin. 63, Elements of	3
Military 25	2	Civ. E. 34, Statics	3
Phys. Ed. 33	1	Military 26	2
		Phys. Ed. 34	1

SUMMER (6 WEEKS)

Civ. E. 28, Prop. & Topog. Surveying	3	Civ. Eng. 30, Route Surveying Practice	3

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Psych. 26, Econ. 25 or Soc. 25	3	Econ. 25, Psych. 26 or Soc. 25	3
Civ. Eng. 51, Strength of Mat'ls	4	Civ. Eng. 70, Theory of Structures	4
Civ. Eng. 55, Transportation Engin.	3	Civ. Eng. 61, Testing Mat'ls.	2
Civ. Eng. 52, Dynamics	3	Civ. Engin. 80, Soil Mechanics	3
Mech. Eng. 61, Heat Power*	3	Mech. Engin. 39, Mat'ls. of Constr.*	2
Geol. 50, Engin. Geol.	3	Civ. Eng. 75, Fluid Mechanics	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Civ. Eng. 71, Structural Design	3	Civ. Eng. 78, Sanitary Engin. II	4
Civ. Eng. 73, Reinforced Concrete Design	4	Civ. Eng. 90, Contracts, Specif. & Est.	3
Civ. Engin. 76, Fluid Mech. Lab.	1	Civ. Eng. 92, Professional Sem.	1
Civ. Eng. 77, Sanitary Engin. I	3	Technical Electives (Civ. Eng. 72, 86, 88, 94, 96, 98, Bact. 54, recommended)	6
Civ. Eng. 81, Caissons	3		
English 83, Technical Writing	2		
Non-Tech. Elective*	3	Non-Tech. Elective*	3

* Replaced by military for military majors.

Electrical Engineering

C. S. Roys, *Adviser*

Electrical engineering is that branch of the profession covering the engineering applications of electricity. It reaches into practically every profession, every branch of activity, either through performance of the tasks involved, or through their measurement and control. Because it is so diversified in its applications, it is considered to be divided into various fields such as power, communications, electronics, illumination, measurements and control and others, each of these having specialized subdivisions.

The undergraduate curriculum is designed to prepare the student for work in any of these fields, and to serve as a basis for specialization in any of them, either in advanced courses or in the field. At the same time, about one-fifth of the student's work is devoted to the humanistic-social courses so that he may have an understanding of the broader aspects of engineering and its relation to other fields of human endeavor.

SUMMER (Following Freshman Year)

Mechanical Engineering 23, Shop, 3 credit hours.

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25, Humane Letters	3	English 26, Humane Letters	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Physics 27, General	4	Physics 28, General	4
Elec. Engin. 41, Fundamentals	4	Civ. E. 34, Statics	3
Military 25	2	Elec. Engin. 42, A-C. Circuits	3
Physical Ed. 33	1	Military 26	2
		Physical Ed. 34	1

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Elec. Engin. 53, D-C. Machinery	4	Elec. Engin. 54, A-C. Machinery	4
Elec. Engin. 55, Electronics	3	Elec. Engin. 56, Appld. Electrn.	4
Elec. Engin. 57, Engin. Analysis	3	Elec. Engin. 58, Elec. Trans.	3
Mech. Engin. 65, Heat Engin. I	3	Mech. Engin. 66, Heat Engin. II	3
Civ. Engin. 52, Dynamics	3	Civ. Engin. 53, Strength of Mat.	3
**Econ. 25, Psych. 26, or Soc. 25	3	‡English 83, Tech. Writing	2

SUMMER

Elec. Engin. 85, Electrical Measurements, 3 credit hours.

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Elec. Engin. 83, Transient Analysis	4	Elec. Engin. 92, Prof. Seminar	1
Ind. Engin. 86, Ind. Mgt.	3	♯Mech. Engin, 37, Basic Engin. Mat'l	3
♯Mech. Engin. 81, M. E. Lab. I	2	Econ. 25, Psych. 26 or Soc. 25	3
Civ. Engin. 75, Fluid Mechanics	3	Technical Elective (Elec. Engin. 78, 80, 84, 86, 90, 94, 96, 98)	6 to 8
Technical Elective (Elec. Engin. 78, 79, 81, 87)	4	Non-Tech. Elective*	3
Non-Tech. Elective*	3		

* Recommended as non-technical electives: Govt. 26, Bus. Law 70, Psych. 86.

♯ Not required of advanced military students.

** Postponed to senior year replacing non-technical elective for advanced military students.

Mechanical Engineering

W. H. Weaver, *Adviser*

Mechanical engineering is that branch of the profession which, broadly speaking, covers the fields of heat, power, design of machinery, industrial management and manufacturing problems.

Building upon the foundation laid by the departments of mathematics, physics, and chemistry, the department of mechanical engineering undertakes to show the student how fundamental physical laws apply to this field of the profession. The courses selected give the student thorough training in the basic principles so that particular applications can be mastered in professional practice. Therefore, no attempt is made to give highly specialized instruction.

It must be realized that the modern engineer lives in a time of rapid social and technological change. Only the man who has had a well-balanced cultural and technical program of study can adjust quickly enough to the needs of a continually changing social order. The following curricula emphasize the fundamentals of the four M's of engineering: materials, methods, men, and money, a knowledge of which is vital to the modern engineer.

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25, Humane Letters	3	English 26, Humane Letters	3
Math. 31, Integ. Calculus	4	Math. 32, Diff. Equations	4
Physics 27, General	4	Physics 28, General	4
Mech. Eng. 37, Basic Engin. Mat'l	3	Civ. Eng. 34, Statics	3
Ind. Engin. 25, Prod. Processes	2	Mech. Eng. 46, Fund. of Metallurgy	3
Military 25	2	Military 26	2
Physical Ed. 33	1	Physical Ed. 34	1

SUMMER (Following Sophomore Year)

Mechanical Engineering 27 and 28, Shop, 6 credit hours.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
♯English 83, Tech. Writing	2	♯Psych. 26, Econ. 25 or Soc. 25	3
Civ. Engin. 52, Dynamics	3	Civ. Engin. 75, Fluid Mech.	3
Mech. Eng. 63, Eng. Thermodynamics I	4	Civ. Engin. 76, Fluid Mech. Lab.	1
Elec. E. 61, Principles	4	Mech. Eng. 68, Kinematics	3
Civ. Eng. 51, Strength of Mat'ls.	4	Mech. Eng. 64, Eng. Thermodynamics II	3
Civ. Eng. 61, Testing of Mat'ls.	2	Mech. E. 67, Mech. Instr. Lab.	1
		Elec. Eng. 62, Principles	4

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Mech. Eng. 87, Engin. Thermo. III	3	Psych. 26, Econ. 25 or Soc. 25	3
Mech. Eng. 79, Mech. Eng. Lab.	1	Mech. E. 80, Mech. Eng. Lab.	2
Mech. Eng. 83, Machine Design	3	Mech. E. 82, Heat Transfer or Mech. E. 84, Basic Engin. Analysis	3
Mech. Engin. 85, Dynamics of Mach.	4	Mech. E. 86, Adv. Mach. Des.	3
Mech. Eng. 91, Sem.	1	♯Technical Elect.†	3
♯Technical Elect.†	3	♯Non-Tech. Elect.	3
♯Non-Tech. Elective	3		

♯ Advanced military students take military in place of English 83 and Econ. 25, Psych. 26 or Soc. 25 during junior year. During senior year they take military and Econ. 25, Psych. 26 or Soc. 25 in place of the technical and non-technical electives.

† Technical electives: Mech. Engin. 74, 75, 76, 77, 82, 84, 88, 90, 94; Ind. Engin. 86; Elec. Engin. 64; Civ. Engin. 88.

Industrial Engineering Option

W. H. Weaver, *Adviser*

Industrial engineering is concerned with the engineering aspects of the organization, operation and management of manufacturing plants. It is based on the premise that the operation of a manufacturing plant is fundamentally an engineering activity. Consequently, the industrial engineering curriculum is built on a foundation of mechanical engineering. To the technical knowledge and scientific attitude developed through the study of engineering is added the study of certain courses in the humanities, in economics, and in management.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Econ. 25	3	Ind. Engin. 82, Work Simplification	2
Mech. Eng. 65, Heat Engin.	3	Mech. Eng. 66, Heat Eng.	3
Civ. Eng. 53, Strength of Mat'ls.	3	Civ. E. 52, Dynamics	3
Elec. Eng. 61, Prin. of Elec. Eng.	4	Elec. Eng. 62, Prin. of E. E.	4
Acct. 25, Prin. of Bus.	3	Acct. 26, Prin. of Bus.	3
Ind. Engin. 51, Ind. Mgt.	3	Mech. Eng. 68, Kinematics	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Civ. Eng. 75, Fluid Mech.	3	Psych. 26, or Soc. 25	3
Mech. Engin. 79, Lab. I	1	Statistics 79, Elem.	3
Mech. Engin. 83, Mach. Design	3	Ind. Engin. 78, Factory Pl.	2
Ind. Engin. 75, Job Evaluation	2	Ind. Engin. 80, Budget Con.	3
Ind. Engin. 76, Time Study	3	Ind. Engin. 54, Eng. Econ.	3
Ind. Engin. 77, Prod. Control	3	Ind. Engin. 92, Sem.	1
Non-Technical Elective	3	Non-Technical Elective	3

Agricultural Engineering

The University has discontinued the professional curriculum in Agricultural Engineering as of July 1, 1955. However, agricultural engineering is concerned with the application of engineering principles to the agricultural industry. Mechanical and electrical power, processing equipment, planning and design of farm structures, soil and water conservation, research, and resident and extension instruction all form parts.

A student interested in pursuing a career in this applied field of engineering should major in one of the engineering departments offering work according to his particular interest as follows:

Drainage, irrigation and farm structures	Civil Engineering
Farm machinery, maintenance and design	Mechanical Engineering
Electrical machinery and electrification	Electrical Engineering
Food processing	Chemical Engineering

He will have the opportunity to elect some courses in agriculture and related fields his senior year. No formal curriculum for this year is planned so that individual interests can be met. Programs will be arranged by the head of the agricultural engineering department and the head of the major department concerned. The student will receive the degree of the department in which he majors.

SCHOOL OF HOME ECONOMICS

HELEN S. MITCHELL, *Dean*

The four-year integrated program in Home Economics prepares young women for challenging professional careers as dietitians in hospitals, clinics, hotels, in other institutions and as community nutritionists. Various opportunities are open in extension service, in family welfare organizations, in business and industry, where manufacturers and public utilities require the services of qualified home economists. Fashion, textiles, merchandising and retailing, journalism, advertising and television frequently turn to the home economist for their personnel. Home Economics education prepares teachers for preschool, secondary and adult teaching programs; those interested in home economics and elementary education may combine the two through a cooperative arrangement with the School of Education.

In addition to preparation for a career in one of these professions, the graduate home economist has developed an appreciation of the knowledge, understandings, attitudes and skills essential to the complex role of modern women in homemaking and community life, in the dual role of marriage combined with a career now or in later years.

The first two years are built around a program of general studies prescribed for all University students. The junior and senior years allow opportunity for further electives outside the professional field.

FRESHMAN YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 1, Composition	2	English 2, Composition	2
Speech 3	1	Speech 4	1
Chemistry 1, General	3	Chemistry 2, General	3
Foreign Language	3	Foreign Language	3
Home Ec. 3, Nutrition	3	Home Ec. 4, Textiles	3
Physical Education 7	2	Math. 12	3
[1]Elective	3	Physical Education 8	2

[1] Elective to be chosen from the following:

Zoology 1, required for majors in Foods and Nutrition, Pre-research, or Child Development.

Math 7 recommended for Pre-research majors planning to take Physics 25 and 26.

Botany 1, History 5.

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25, Humane Letters	3	English 26, Humane Letters	3
Economics 25, Elements	3	Psychology 26, General	3
Chem. 33, Organic	4	Zool. 1 or 35 or	3
Physical Education 27	2	Bact. 31	4
[1]Electives	6	[2]Home Ec. 30, Foods	3
		Physical Education 28	2
		[1]Elective	3

[1] One of the following electives must be taken and two may be taken during the sophomore year: Home Ec. 31, Applied Art; Home Ec. 25, Consumer Clothing Problems; Home Ec. 35, Clothing Construction. Other electives: Accounting 25; Art 31, 34; Bacteriology 31; Chem. 29 and 30; Econ. 26; Government 25; Sociology 25; Language.

[2] Merchandising majors and Child Development majors take Home Ec. 30 sophomore year and Home Ec. 51 junior year, or Home Ec. 25 sophomore year and Home Ec. 56 junior year.

JUNIOR-SENIOR CURRICULA IN HOME ECONOMICS

A student may specialize in one of several fields of Home Economics during the junior and senior years. In consultation with her faculty adviser, each student will choose courses directly related to her objective. To qualify for a B.S. degree in Home Economics a student during the junior and senior years must have at least 15 but not more than 30 credits in the major field and not more than 42 credits in the School of Home Economics. The following courses or their equivalent are required for all majors: Home Economics 51 or 56, 52, 75, 77, 90. The following curricula are suggestive. Those interested in other types of professional work should consult with advisers about desirable electives. For students not interested in professional work, a more liberal choice of electives is possible.

Child Development and Family Life Education

Students interested in child development, nursery school work and social service work should choose this curriculum. The University has arranged for two affiliations for qualified students interested in taking one semester of specialized work elsewhere: with Merrill-Palmer School in Detroit, which specializes in education for home and family life, and with the Nursery Training School in Boston which gives professional training for teaching in nursery schools and kindergartens. Students interested in combining this major with elementary education should elect Education 61 and 64 as juniors.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Home Ec. 70, Child Developm't	3	Home Ec. 52, Nutrition	3
Home Ec. 75, Ec. of Household	3	Home Ec. 56, Meal Planning	3
Home Ec. 63, Arts and Crafts	3	Home Ec. 80, Family Life	3
Electives	6	Psych. 56, Educational	3
		Electives	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Home Ec. 85, Nursery Sch. Mgt.	3	Ed. 85, Practice Teaching	3
Home Ec. 81, Methods	3	Home Ec. 77, Household Mgt.	3
Home Ec. 95, Child Nutr.	3	Home Ec. 90, Seminar	1
Electives	6	Electives	9

Foods and Nutrition and Institution Administration

This curriculum prepares for such professions as therapeutic dietitian or administrative dietitian or nutritionist and meets the requirements of internships approved by the American Dietetic Association. This curriculum is also advised for those interested in home service, food testing and commercial demonstrating related to foods.

Bacteriology 31, Zoology 35, and Accounting 25 should be elected sophomore year, if possible, to satisfy requirements of the American Dietetics Association.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Home Ec. 51, Meal Planning	3	Home Ec. 52, Nutrition	3
Home Ec. 75, Ec. of Household	3	Home Ec. 60, Household Equip.	2
Home Ec. 81, Methods	3	Home Ec. 70, Child Develop.	3
Chem. 79, Biochemistry	4	Electives	6-8
Elective	3		

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Home Ec. 61, Demonst. Tech.	2	Home Ec. 77, Home Mgt.	3
Home Ec. 71, Retail Fd. Buy.	3	Home Ec. 90, Sem.	1
Home Ec. 89, Diet Therapy	3	Home Ec. 92, Inst. Adm.	3
Home Ec. 91, Institution Adm.	3	Home Ec. 93, Experimental Fds.	3
Elective	4	Electives	6

Pre-Research in Nutrition

This curriculum is planned for the students who wish to prepare for graduate work in nutrition or biochemical research. The course should be planned with the advice of the Dean of the School.

Pre-research majors are advised to take Chemistry 29 and 30 in place of Chemistry 33, Zoology 35, and Bacteriology 31 in the sophomore year, and may elect Physics 25 and 26.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Chemistry 51, Organic	4	Bacteriology 31, Intro.	4
Home Ec. 51, Meal Planning	3	Chemistry 52, Organic	4
Home Ec. 75, Ec. of Household	3	Home Ec. 52, Nutrition	3
Zool. 35, Physiol.	3	Electives	4-6
Elective	3		

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Chemistry 79, Biochemistry	4	Home Ec. 77, Home Management	3
Home Ec. 89, Diet Therapy	3	Home Ec. 90, Sem.	1
Home Ec. 95, Child Nutrition	3	Home Ec. 93, Experimental Foods	3
Electives	6	Home Ec. 98, Special Problems	3
		Electives	6

Home Economics Education and Extension

Preparation for teaching demands the same basic courses whether a student plans to teach adults or 4-H club groups in Extension, or young people at the high school or junior high school level. Teachers should be ready to teach some subject other than home economics if demanded; extension workers need special work in rural sociology and adult education. Courses in speech and writing are important. Camp teaching or apprentice training is recommended between junior and senior year.

Two of the following electives should be taken in sophomore year and the third in junior year: Home Economics 25, 31, 35. Students who wish to take 6 credits in teaching under the Block System for Secondary School Teacher Training must reserve one semester of their senior year for this program.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Home Ec. 51, Meal Planning	3	Home Ec. 52, Nutrition	3
Home Ec. 75, Ec. of Household	3	Home Ec. 70, Child Develop.	3
Home Ec. 81, Methods	3	Home Ec. 80, Family Life	3
Education 51, History	3	Psych. 56, Educational	3
Elective	3	Elective	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Home Ec. 61, Demonst. Tech.	2	Home Ec. 62, Home Furnish.	3
Home Ec. 77, Home Mgt.	3	Home Ec. 90, Seminar	1
Home Ec. 87, Tailoring	3	*Electives	11
*Electives	7		

* Electives recommended for teachers: Education 85 and 52; for extension workers: Education 79, Home Economics 98, Sociology 52.

Merchandising and Retailing

This curriculum provides an opportunity for girls interested in preparing for the merchandising field. The junior and senior curriculum includes courses in home economics and in business administration and should be planned with the faculty adviser by the end of the freshman year if possible. Students choosing this program are expected to take Home Economics 31 or 25, Accounting 25, and Economics 26 in the sophomore year, and should plan on at least a year of in-service training after college. If the interest is primarily in business, see the Merchandising major under the School of Business Administration.

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Home Ec. 35, Clothing Constr.	3	Home Ec. 56 or 51, Meal Planning	3
Home Ec. 75, Ec. of Household	3	Home Ec. 52, Nutrition	3
Mktg. 53, Mktg. Prin.	3	Home Ec. 62, Home Furnishings	3
Elective	6	Mktg. 54, Salesmanship & Mgt.	3
		Electives	3

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Home Ec. 87, Tailoring (optional)	3	Home Ec. 77, Home Management	3
Mktg. 71, Retail Merchandising	3	Home Ec. 88, Dress Design (optional)	3
Mktg. 73, Advertising	3	Mktg. 62, Mktg. Research	3
Electives	6	Home Ec. 90, Seminar	1
		Electives	6

SCHOOL OF NURSING

MARY A. MAHER, *Dean*

The basic professional nursing program is designed to prepare qualified high school graduates for a career in professional nursing, for marriage and family living. It aims to equip the student with those understandings, attitudes, skills and appreciations which are essential for a competent practitioner and health teacher.

The program is planned specifically to help the student increase her self-understanding so that she may function constructively and creatively in her personal and professional relationships; enhance and improve her emotional, physical, social and spiritual well-being; extend her understanding of the health needs of the individual and family and of the community organizations primarily concerned with the promotion of health and prevention of illness; improve her professional competency as she ministers to the individual and the family in selected clinical situations; more fully understand and appreciate her role in the nursing, the therapeutic and the health team; become sensitive to the need and responsibility for periodic appraisal and improvement of professional nursing practice; become a more self-directive and responsible member of the profession and of the community; and improve her professional competency through continued study.

The graduate of such a program is ready for a beginning position in a variety of nursing situations, including public health; for leadership in the hospital nursing team; and for participation with allied personnel in providing comprehensive patient care. A foundation is laid for advanced study, through which the nurse may prepare for positions in teaching, supervision, administration, consultation and research.

During the first two academic years at the University, the student builds an educational foundation upon which to base the more specialized portion of the program. Courses in the humanities and in the sciences—biological, physical and behavioral—are taken with other students on the campus.

The clinical aspects of the program are developed in the next two and one half years, when instruction and correlated clinical practice is given in selected cooperating agencies by the nursing faculty of the University and allied professional staffs of the cooperating agencies. These agencies include: the Springfield Hospital; the Wesson Maternity Hospital, Springfield; the Visiting Nurse Association of Springfield; the Springfield Health Department; the New England Medical Center, Boston; and the McLean Hospital, Waverly.

The student returns to the campus for a fifth academic semester, upon completion of which a Bachelor of Science degree is awarded. This qualifies the graduate for State Board Examinations in Nursing. If achievement in these examinations is satisfactory, the candidate receives legal status as a registered nurse within the state.

PROGRAM SEQUENCE

First Year

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 1, English Comp.	2	English 2, English Comp.	3
Speech 3	1	Speech 4	1
Chemistry 1, General	3	Chemistry 2, General	3
Zoology 1, Introductory	3	Zoology 35, Vert. Physiol.	3
Mathematics 12, Functional	3	Psychology 26, General	3
History 5, Mod. European Civil.	3	Sociology 25, Introduction	3

Second Year

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25, Humane Letters	3	English 26, Humane Letters	3
Chemistry 33, Organic	4	Bacteriology 31, Introductory	4
Sociology 53, Intro. Study, Cultural Anthrop.	3	Home Economics 42, Med. Diet.	2
Home Economics 41, Nutri. & Food Prep.	4	Home Economics 70, Child Devel.	3
Psychology 56, Educational	3	Nursing 26, Orient. to Nursing	4

Summer Session

		Credits
Nursing 27,	Fundamentals of Nursing	9
Nursing 28,	Social and Historical Foundations of Nursing	2

Third Year

Nursing 51,	Medical and Surgical Nursing I	16
Nursing 52A,	Nursing of Children I	2
Nursing 54,	Psychiatric Nursing	6
Nursing 57,	Maternity Nursing	5

Fourth Year

Nursing 52B,	Nursing of Children II	5
Nursing 60,	Medical and Surgical Nursing II	8
Nursing 58,	Public Health Nursing	3
Nursing 56,	Tuberculosis Nursing	3
Nursing 70,	Management of Hospital Nursing Unit	2

Fifth Year

Nursing 65,	Senior Internship	4
Nursing 66,	Senior Nursing Seminar	4
Philosophy 64,	Ethics	3
History 6,	Modern European Civilization	3
Electives		5

DEPARTMENTS OF MILITARY SCIENCE AND AIR SCIENCE RESERVE OFFICERS TRAINING CORPS

Colonel Raymond P. Tarr, Jr., *U. S. Army, Head*
Colonel Donald B. White, *U. S. Air Force, Head*

An Act of Congress, July 2, 1862, required the Commonwealth of Massachusetts to provide a two-year course in military instruction at the Massachusetts Agricultural College when it was established. All able-bodied male students who were enrolled for four years were required to take this training. This requirement has continued until today, although The National Defense Act of 1916, as amended in later years, created a Reserve Officers' Training Corps at those colleges which were giving military instruction.

The National Security Act of 1947, which created the United States Air Force as a separate armed service, also resulted in separate Army and Air Force Reserve Officers' Training Corps units being organized at the University of Massachusetts and other colleges and universities.

All physically qualified male candidates for a degree in any four-year course at the University, except Veterans, are required to take the basic course (Army or Air) during freshman and sophomore years.

The choice of service, Army or Air Force, must be made by each student when he initially enrolls. The student in the basic course is provided with a uniform of the service in which he is enrolled. A deposit of $30.00 is required to cover the cost of loss or damage to any of the articles issued.

Military Science

The purpose of the Army Reserve Officers Training Corps Program is to train those college students who possess the necessary aptitude and attributes for positions of leadership in the Armed Forces of the United States, in the event of a national emergency.

In addition to the required two year course in military instruction, the Army Reserve Officers Training Corps Program offers an advanced course. This course, which stresses training in leadership, is elective and is available to all fully qualified male students. Students who are accepted for this advanced training by the Univer-

sity and the Professor of Military Science and Tactics will receive the following benefits:

(1) The Government will give him a substantial uniform allowance and pay him approximately $30.00 per month while in attendance at the University during his junior and senior years.

(2) Upon successful completion of the Advanced Course the student will be commissioned a second lieutenant in the Army of the United States.

(3) Outstanding Advanced Course students will be offered commissions as second lieutenants in the Regular Army.

Air Science

Primarily the AFROTC program is intended to provide the Air Force with officers who are ready for active duty, but it is also of benefit to cadets who will remain civilians. The purpose of the instruction is to increase the student's ability to understand and evaluate national and world affairs in the Air Age by giving him a new perspective on international developments, on the place of civilian and military aviation in the U. S. economy, and the importance of air power in the defense of the Nation.

The first two years of instruction, Basic AFROTC, give a foundation for leadership and Air Age citizenship. The program of the second two years, Advanced AFROTC (and four weeks of summer training at the end of the junior year) is designed primarily to provide officer training for those selected and qualified for flight training or are technically qualified and are under Air Force contract. A category system for selection of Advanced AFROTC students is as follows:

I. A cadet medically qualified as Class I by an Air Force Flight Surgeon and has an acceptable pilot aptitude stanine rating (AFOQT).

IA. A cadet medically qualified as Class I or IA by an Air Force Flight Surgeon and has an acceptable observer aptitude stanine.

II. A cadet medically qualified by an Air Force Flight Surgeon to receive a reserve commission. The cadet must be enrolled as a scientific, technical, or engineering major.

III. A cadet medically qualified by an Air Force Flight Surgeon to receive a reserve commission and not medically or aptitudinally qualified to pursue flight training.

IV. A cadet medically qualified by an Air Force Flight Surgeon to receive a reserve commission. He may have any type of academic major but must have had sufficient prior military service to qualify as a veteran.

DIVISION OF PHYSICAL EDUCATION

W. P. McGuirk, *Head*

The Division of Physical Education includes the Departments of Physical Education for Men, Physical Education for Women, and Athletics. It offers one major, that in Physical Education for Men.

Physical Education for Men

S. W. Kauffman, *Adviser*

GENERAL PROGRAM

Each male freshman and sophomore student is required to successfully complete four semesters of physical education and demonstrate his ability to swim as a requirement for his degree, unless exempted under the following conditions. The physical education requirement does not apply to those students excused by the University physician; veterans of military service; and certain transfer students.

Students may receive credit for physical education, during the sport in season, by becoming a squad member of any freshman or varsity team. Freshmen students who elect an athletic team sport for physical education credit must rejoin their class section at the termination of the seasonal sport. Students may not participate in a given sport for credit for more than two semesters.

In fulfilling the requirements all students must have participated in three team sports, four individual activities and aquatics.

MAJOR PROGRAM

The major program leading to the degree of Bachelor of Science in physical education is designed to train the student for a career as a teacher of physical education. The curriculum combines both general and professional education and provides for full teacher certification for the student who has met the prescribed requirements of preparation. The program also provides for adequate training in a minor area of teaching, elected by the student, including the coaching of inter-school athletics.

The outline of the physical education major follows:

FRESHMAN YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 1	2	English 2	2
Speech 3	1	Speech 4	1
P. E. 23, Principles of Health Ed.	3	Govt. 25 or History 6	3
Psych. 26, Gen. Psychology	3	Mathematics 12 or 14	3
P. E. 21, Intro. to Phys. Ed.	3	P. E. 22, First Aid and Safety	3
Military I	3	Military 2	2
P. E. 5, Skills and Techniques	1	P. E. 6, Skills and Techniques	1

Elect One		*Elect One*	
Chemistry I	3	Chemistry 2	3
Botany I	3	Botany I	3
Zoology I	3	Zoology I	3

SOPHOMORE YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
English 25	3	English 26	3
Zoology 35, Physiology	3	Bacteriology 31	4
P. E. 41, Anatomy	3	P. E. 42, Kinesiology	3
Economics 25, or Sociology 25	3	Psych. 56, Educ. Psychology	3
P. E. 35, Skills and Techniques	1	P. E. 36, Skills and Techniques	1
Military 25	2	Military 26	2
Electives	3	Electives	3

JUNIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Rec. Ed. 51, Principles of Recreation	3	Psych. 94, Child Psych.	3
P. E. 55, Org. and Adm. of P. E.	3	Speech 91, Extempore Speech	3
P. E. 57, Meth. & Mat. Coaching (baseball-gymnastics)	2	P. E. 54, Phys. Ed. Sec. Sch.	3
P. E. 59, Adaptive Phys. El.	3	P. E. 58, Meth. & Mat. Coaching (track-football)	2
P. E. 63, Skills and Techniques	1	P. E. 64, Skills and Tech.	1
Electives	6	Electives	6

SENIOR YEAR

1st Semester	*Credits*	*2nd Semester*	*Credits*
Ed. 52, Prin. and Meth. Teach.	3	P. E. 76, Philos. and Prin. Phys. Ed.	3
Ed. 88, Sec. Sch. Curriculum	3	P. E. 74, Tests and Msmts. in Phys. Ed.	3
*Ed. 85, Practice Teaching	6	P. E. 78, Physiology of Exercise	3
P. E. 53, Phys. Ed. Elem. Sch.	3	P. E. 82, Meth. anl Mat. of Coaching (soccer-basketball)	2
P. E. 83, Skills and Techniques	1	P. E. 84, Skills and Tech.	1
		Electives	6

Physical Education for Women

RUTH J. TOTMAN, *Adviser*

The courses in physical education for women are planned to provide recreative activity, to develop body grace and efficiency, and to increase health and vigor. No major is available.

The first and second year women students are required to take physical education three times a week and are given two credits for each semester of satisfactory work. Third and fourth year students may elect Physical Education 63, 64, 65, 66, 68. Sophomores may take these courses by special permission.

Department of Athletics

W. P. McGuirk, *Director*

The following men are in charge of the coaching of the intercollegiate teams:

Charles C. O'Rourke, head coach of football and coach of golf; Chester S. Gladchuk, assistant coach of football and coach of freshman basketball; Robert T. Curran, head coach of basketball and coach of freshman baseball; Earl E. Lorden, assistant director of athletics, head coach of baseball, assistant coach of football; William Footrick, coach of track and cross country; Lawrence E. Briggs, coach of soccer and skiing; Henry B. Woronicz, head freshman football coach and supervisor of intramural sports; Stephen R. Kosakowski, coach of hockey and tennis and supervisor of Stockbridge School athletics; Richard F. Garber, coach of lacrosse and Stockbridge basketball; John Douglas, coach of wrestling; Joseph R. Rogers, Jr., coach of swimming, coach of pistol; James Bosco, coach of gymnastics; Edward Shea, Director of Sports Relations.

RELIGION

Chaplains Power, Ruchames, and Seely, *Advisers*

The courses in the history of religion, the articles of belief and the application of religious principles are given by the Chaplains of the three major western faiths and by others designated by the churches represented. They are financially independent of the University although the facilities of the University are available as for other courses.

Courses are offered in this field for the sake of the student who is interested in rounding out his educational program with the acquiring of a mature perspective in religion. The opportunity is offered for the student to gain a wide knowledge of the forces which have been basic to his culture, an understanding of the religious influences in his own life, and an evaluation of the part that religion plays in current social movements.

Students register for these courses at the regular registration period and may do so in addition to a normal semester load. No academic credit accrues from participation in the courses in religion.

DIRECTORY OF COURSES

This section contains a list of courses offered in the regular sessions of the University. Course descriptions are arranged alphabetically according to subject matter fields. If any course cannot be found readily, refer to the General Index in the back of the catalogue. A separate bulletin will outline those available during the summer. The University reserves the right to withdraw any course for which an insufficient number of students enroll.

Courses are designated by numbers as follows: freshman 1-24 inclusive; sophomore 25-49 inclusive; junior 50-74 inclusive; senior 75-99 inclusive. Odd numbers designate courses given in the first semester, even numbers those offered during the second. Credit is indicated in terms of semester hours. Where possible, the class schedule follows the course description. A complete schedule of class hours is published at the beginning of each semester.

Students are referred to the section on Divisions of Study and Curricula for a statement of graduation requirements and majors available.

AGRICULTURAL ECONOMICS AND FARM MANAGEMENT

Professor Lindsey, Assistant Professor Russell,
Assistant Professor Callahan.

26. (II) Economics of Agricultural Production

This course considers the principles of production economics. An anlysis of specialization, comparative advantage, diminishing, constant, and increasing costs and returns applied to the individual establishment as well as to the nation. A careful study of the combination of the factors of production is made considering the individual's adjustment when operating under monopolistic competition, laissez-faire, and monopoly. Finally, dynamic and static factors are considered in relation to their effects on the individual's production, on the economy of cities and nations, and on the international economy.

3 class hours. Credit, 3
8:00-8:50 M. W. F. The Department.

55. (I) Marketing Farm Products

Not open to students who have taken or are taking Marketing 53. An analysis of present and past systems of assembling, transporting, distributing, and grading agricultural products. Such aspects as the adjustment of produc-

tion and consumption, price formation, channels of distribution, price differentials and margins, public policy, market reporting and forecasting, and a study of the marketing of major agricultural products are considered. Geographic, future, and quality differentials are studied from the agricultural and commercial standpoint. A field trip may be arranged.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. The Department.

56. (II) The Fundamentals of Cooperation

A study of the philosophy and principles of cooperation in Europe and in the United States. The history of cooperation, legal consideration, management, financing, membership relations, methods of formation, sales methods and policies are given full attention. Progress in the cooperative marketing of different agricultural products is studied.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. Callahan.

57. (I) Agricultural Credit and Land Appraisal (1956-57)

A study of the development, use, functions, and operations of public and private credit institutions which are available to agriculture. Special emphasis is given to the practical aspects of credit policy and land appraisal. Given in alternate years.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. Lindsey.

71. (I) Agricultural Economic Theory (1957-58)

The course is a comparative and critical study of the significant contributions of the leading economists to the theory of agricultural economics from the time of Adam Smith to the present. Given in alternate years.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. Lindsey.

75. (I) Farm Organization and Management

This course analyzes the functions of the farmer as a business proprietor. Both the external and internal economic forces affecting the farm business are considered, such as selection and combination of factors of farm production, choice and combination of farm enterprises, the economical use of funds, the nature of farming costs, adjusting farm production to markets and prices, and the management of equipment and labor.

3 class hours. Credit, 3.
9:00-9:50 M. W. F. The Department.
Prerequisite, Agricultural Economics 26.

76. (II) Advanced Farm Organization and Management

The use of farm records and accounts as a basis for planning and budgeting is emphasized. Measures of success and factors in success in farming, and work simplification as applied to efficient farm techniques are considered. The last part of the course will be given over to the specific study of selected farms

and the practical application of the principles and practices already discussed. Field trips are required at an estimated cost of not over five dollars.

1 class hour; 1 4-hour laboratory period. Credit, 2
10:00-10:50 Th.; 1:00-4:50 M. The Department.
Prerequisite, Agricultural Economics 75.

78. (II) Principles and Problems of Land Economics

A study of the major contributions by outstanding economic writers to theoretical land economics; a review of American land policies; a presentation of the principles, techniques, and objectives involved in modern land use planning; and a discussion of contemporary land problems in the United States.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. Lindsey.

83. (I) Advanced Farm Operation

For seniors specializing in agriculture; others by permission of instructor. A study of the efficiency of operations on a specific farm.

3 hours or equivalent. Credit, 3.
Hours by arrangement. The Department.

89. (I) 90. (II) Seminar in Agricultural Economics

A study of special problems in agricultural policy, agricultural institutions, market and price analysis.

Hours by arrangement. The Department.

STATISTICS

77. (I) Elementary Experimental Statistics

Primarily for students in psychology, sociology, biology, chemistry, agronomy, poultry, animal husbandry, food technology, education, and public health, who are interested in obtaining and handling data of small samples. Chi square, "t" and analysis of variance tests of significance; frequency distribution, averages, dispersion, regression and simple correlation description; and chart and table presentation are the specific fields covered. Students taking this course may not take Statistics 79.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Lindsey, Mr. Russell.

79. (I) Elementary Economics Statistics

Primarily for students in economics, business administration, mathematics, and industrial engineering, who are interested in obtaining and presenting the data of large samples. Surveys, tables, charts, frequency distributions, averages, dispersion, standard error and its use, quality control, index numbers, time series, and simple correlation are the specific fields covered. Students taking this course may not take Statistics 77.

3 1-hour periods; 1 2-hour laboratory period. Credit, 3.
Mr. Lindsey, Mr. Russell.

80. (II) Advanced Statistics

This course is primarily devoted to linear and curvilinear multiple correlation analysis. Machine and shortcut graphic methods are used. Some time will also be devoted to probability and analysis of variance.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
1:00-1:50 W.; 1:00-2:50 M. F. Mr. Lindsey, Mr. Russell.

AGRICULTURE

1. (I) Economic Geography of the World's Agriculture

The agriculture of North America is given first consideration but special emphasis is placed on the study of southeastern Asia and the Soviet Union.
3 class hours. Credit, 3.
Mr. Jeffrey.

AGRICULTURAL ENGINEERING

Assistant Professor Zahradnik, Associate Professor Markuson, Assistant Professor Tague, Mr. Powers, Mr. Pira.

51. (I) House Planning

Plan designs of the small house will be made. The arrangement of interior equipment, especially in the kitchen, and lighting, heating, water supply, and sewage disposal will be studied, together with a brief history of the house materials, construction methods, equipment, and architectural styles. Consideration will be given to the economics of house building, including financing, and to maintenance and overhead expense.
1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Markuson.

55. (1) Farm Shop

For students in agriculture and horticulture. Laboratory exercises cover instruction and practice in the use of carpenter's tools in construction and in bench work, arc and gas welding, pipe fitting, soldering, use of machinist's tools in machinery repair, and the mixing and placing of concrete. Classroom instruction covers materials of construction and the utilization of local and special materials for these purposes.
1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Powers.

72. (II) Drainage and Irrigation Engineering

This course covers the engineering phase of drainage and reclamation. The various systems are studied, complete layouts established in the field, and problems of flow and run-off given.
1 class hour; 1 2-hour laboratory period. Credit, 2.
The Department.

74. (II) Farm Structures

A study of the strength and durability of building materials, of construction systems and of the mechanical principles underlying their use in farm construction. Studies will be made of some major farm building and complete working drawings finished in all essential details.
1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Markuson.

80. (I) and (II) Food Process Engineering

A study of food processing machinery and instrumentation.
2 class hours; 1 2-hour laboratory period. Credit, 3.
The Department.

82. (II) Refrigeration

Fundamentals in planning and operating a refrigerated storage with particular reference to size, details of construction, cooling load, and refrigerating machinery and accessories. For non-engineering majors.
1 class hour; 1 3-hour laboratory period. Credit, 2.
The Department.

AGRONOMY

Professor Colby, Professor Dickinson, Professor Steckel, Assistant Professor Roberts, Assistant Professor Everson, Assistant Professor Zak, Mr. Southwick.

22. (II) Soils

This is an elementary course relating soils and their management to crop growth. This course is designed to give the student a broad background in soil science and its direct application to practical field problems. The course itself is presented with the object of introducing to the student the properties of soils and their influence upon the production of crops. The laboratory work consists of investigation of the fundamental characteristics of soil and basic principles of fertilizer and liming practices.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Everson, Mr. Zak.

51. (I) Field Crops

A study of the field crops of the United States which include their uses and improvement, with their soil and climatic requirements. Emphasis will be given to the best farm practices of the northeastern states as to rotation, liming, fertilizing, seeding methods, tillage, disease and insect control, and to methods of harvesting and storage. As an individual problem, each student must take a detailed plan of crop production for the actual conditions of some New England farm.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 Th. Mr. Southwick.

52. (II) Forage Crops

An analysis of the basic principles involved in the establishment, fertilization, and management of forage grasses and legumes.

3 class hours. Credit, 3.
Mr. Colby.

57. (I) Soil Formation

The first part of this course considers those physical, chemical, biological, climate and geological factors involved in soil formation. The relationship of these factors to the kinds of soil formed in the United States is discussed.

3 class hours. Credit, 3.
Mr. Everson.

58. (II) Soil Utilization

The relationship of climate and native vegetation to the broader aspects of soil formation is described. Man's use of land resources is connected to show how the agricultural background of settlers has been active in soil use and abuse. Soil erosion control and its significance to permanent agriculture is considered.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. Everson.

77. (I) Crop Improvement

Theory and practice of the improvement of field crops by breeding and selection.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Hours by arrangement. The Department.
Prerequisites, Agronomy 51, Pomology 52, Zoology 53.

78. (II) Fertilizers and Soil Fertility

The primary purpose of this course is to relate soils and fertilizers to plant growth. Studies are made of fertilizer practices in the United States and Europe. In the early part of the course consideration is given to the history of fertilizer development, with special emphasis upon early discoveries and causes of failure in early research. Later in the course, studies are made of factors which relate fertilizers and soils to plant growth. Fertilizer formulation technology and practice are considered in detail in the laboratory phase of this course.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 Th. Mr. Everson.

79. (I) Soil Physics

For seniors specializing in agronomy. The factors in soil which control tilth and energy relationships and the laws of physics which govern these factors are discussed. This includes heat, light, color, particle size and charge, water and gas movement, energy relationships and other physical factors effecting changes in the soil. The laboratory is used to familiarize the students with various methods used in measuring these important physical factors.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Everson.

81. (I) 82. (II) Special Problems in Agronomy

For seniors specializing in agronomy. This course is designed to acquaint students with agronomic research methods and practical agronomic procedures.

3 2-hour laboratory periods. Credit, 3.
Mr. Colby.

84. (II) Soil Chemistry

For plant science and soil science students. Fundamental inorganic, organic, and bio-chemical reactions of soils are discussed and related to plant nutrition and microbiological activities. Colloidal aspects of soil chemical reactions and soil-plant interrelationships will be studied.

3 class hours. Credit, 3.
Mr. Steckel.

Prerequisites: Chemistry 29; Botany 68; Agronomy 57.

84B. (II) Soil Chemistry Laboratory

Primarily for seniors majoring in agronomy. Methods and techniques used in soil chemistry research and in plant science investigations will be studied. The student will be made familiar with methods of determining exchangeable bases, base exchange capacity, soil phosphate fractionation, and many other determinations peculiar to soil investigations. To be taken concurrently with Agronomy 84.

2 3-hour laboratory periods. Credit, 2.
Mr. Steckel.

Prerequisites: Chemistry 29, 30; Botany 68; Agronomy 57.

AGROSTOLOGY

53. (I) Agrostology

All factors that influence the successful growing of fine turf grasses are studied and correlated to enable the student to have a practical working knowledge of the construction and maintenance of lawns, sports, highway, airport and cemetery turf.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Roberts.

56. (II) Agrostology

This course considers fine turf management as a business and profession. Emphasis is placed on diagnosis and treatment of turf failures; the selection of equipment and supplies and client approach. Field trips and practical exercises are arranged.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Roberts.

ART

Instructors in Landscape Architecture.

27. Modeling

A course in elementary modeling, of seeing, analyzing, and reproducing form in clay and modeling wax to develop sculptural technique.

6 laboratory hours. Credit, 3.

The Department.

28. Modeling

A continuation of Course 27 in advanced design and the making of plaster casts from original problems in small sculpture, such as plaques, masks, and medals or other such pieces.

6 laboratory hours. Credit, 3.

The Department.

Prerequisite, Art. 27.

31. (I) Elementary Design

For women. Elementary principles of design as applied to textiles, fabrics, interior decorations, etc.

3 2-hour laboratory periods. Credit, 3.

Mr. MacIver.

33. (I) Freehand Drawing

A non-professional course in elementary drawing and painting in various media in black and white. The work is more or less personal and is adapted to the individual capacities and backgrounds of each student as far as possible. Limited to three sections of 20 students each.

6 laboratory hours. Credit, 3.

Mr. MacIver.

34. (II) Freehand Drawing

This non-professional course is essentially one in which the use of color is stressed in various media, freehand drawing is emphasized and paintings in

still-life and landscape subjects are produced. Limited to three sections of 20 students each.

6 laboratory hours. Credit, 3.

Mr. MacIver.

75. (I) Art Appreciation

An analysis of the principles of critical judgment underlying the fine arts, leading toward the enjoyment of art and its application to every day life.

3 class hours. Credit, 3.

9:00-9:50 M. W. F. Mr. Otto.

78. (II) Early and Medieval Art

An appreciative survey of art and history from early times to the present. Works in painting, sculpture, architecture, and the minor arts are examined in the light of their contributions to the history of civilization, and to the development of art forms.

3 class hours. Credit, 3.

11:00-11:50 M. W. F. Mr. Hamilton.

BACTERIOLOGY AND PUBLIC HEALTH

Professor France, Associate Professor Garvey, Associate Professor Perriello, Assistant Professor Czarnecki, Assistant Professor Mandel, Assistant Professor Larkin, Mr. Wisnieski, in cooperation with Dr. Walter W. Lee, State District Health Officer; Mr. Ernest A. Snow of the Division of Sanitary Engineering of the Massachusetts Department of Public Health.

31. (I) and (II) Introductory Bacteriology

Students majoring in Liberal Arts, Business Administration, and Agriculture taking this course to satisfy a science requirement should take it first semester. Designed to present to students interested in general science, agriculture, horticulture, and home economics the fundamental concepts of bacteriological science; make microorganisms real and significant; and demonstrate their importance in the problems of agriculture, general science, industry, public health, and medicine. The laboratory work covers the use and care of the compound microscope, the preparation of culture media, methods of sterilizing equipment, the isolation and aseptic handling of pure cultures, simple and differential staining, bacterial classification and differential studies on type species of pathogenic and non-pathogenic bacteria.

2 class hours; 2 2-hour laboratory periods. Credit, 4.

12:00-12:50 M. F. or Tu. Th.; 1:00-2:50 or 3:00-4:50 M. F. or Tu. Th.

Mr. Czarnecki, Mr. Larkin.

51. (I) 52. (II) Advanced Bacteriology

A continuation of introductory bacteriology. Studies on bacterial metabolism and the influence of environmental factors on growth and viability. The identification and differentiation of bacterial species by morphological, cultural, physiological, and serological studies; disinfectants and antibiotics. The combined courses give to the student not only a comprehensive picture of various

forms of existing bacteria but develop a specialized technique for their cultivation, isolation, and identification.

2 class hours, 2 2-hour laboratory periods. Credit, 3.
For 51, 12:00-12:50 Tu. Th.; 1:00-2:50 or 3:00-4:50 Tu. Th.
For 52, 1:00-1:50 Tu. Th.; 2:00-3:50 Tu. Th. Miss Garvey.
Prerequisite, for 51, Bacteriology 31; for 52, Bacteriology 51.

54. (I) and (II) Water and Sewage Bacteriology

For students majoring in Engineering. Elementary bacteriology with emphasis placed upon the importance of bacteria found in water and sewage. Work will include routine analysis used in the examination of water and sewage and in the laboratory control of water and sewage treatment plants.

2 3-hour laboratory periods. Credit, 3.
2:00-4:50 Tu. Th. Mr. Perriello.
Prerequisite, Civil Engineering 77 or permission of the instructor.

55. (I) Fundamentals of Soil Microbiology

This course is designed for students majoring in agricultural and related fields. Subjects included will be: fundamental laboratory procedures and techniques; quantative and qualitative microbiological analysis of various types of soils; studies on the carbon and nitrogen cycles as affected by soil microorganisms.

2 3-hour laboratory periods. Credit, 3.
Mr. Mandel.

56. (I) and (II) Methods for Bacteriological Preparations

This course is intended for students majoring in bacteriology and public health. The material given in the course includes methods of preparation and sterilization of culture media and equipment, the preparation of stains and reagents, and the use, care and repair of laboratory instruments.

2 2-hour laboratory periods. Credit, 2.
The Staff.

81. (I) General Applied Bacteriology

This course is designed to give the student a working knowledge of routine and special tests used in present day applied bacteriology. Subjects receiving consideration are: methods for determining the sanitary quality of milk and milk products, water and shellfish; eating and drinking utensils; and air.

2 class hours; 2 2-hour laboratory periods. Credit, 3.
12:00-12:50 M. F.; 1:00-2:50 or 3:00-4:50 M. F.
Mr. France, Mr. Perriello.
Prerequisite, Bacteriology 51 or permission of the instructor.

82. (II) Quantitative and Qualitative Bacteriology

Consideration will be given to (1) bacteriological principles which apply to the preservation, fermentation and spoilage of foods, (2) the sanitary examination of foods, (3) the causes of food poisoning, and (4) microbiological assays.

2 class hours; 2 2-hour laboratory periods. Credit, 3.
1:00-1:50 M. F.; 2:00-3:50 M. F. Miss Garvey.
Prerequisite, Bacteriology 51 or permission of the instructor.

85. (I) Bacteriology (Immunology)

Admission by permission of the instructor. This course includes consideration of host reactions which favor the prevention and cure of disease; qualitative and quantitative estimations of toxins and antitoxins; the use of biological products such as antigens and immune sera in differential bacteriology and in disease diagnosis; and a consideration of isohemagglutinins as determinants of blood groups.

1 class hour; 1 4-hour laboratory period. Credit, 3.
12:00-12:50 W.; 1:00-4:50 W. Miss Garvey.

90. (II) Sanitary Bacteriology

A detailed study of public health laboratory methods. Practical application of methods will be made through field studies.

1 4-hour and 1 2-hour laboratory period. Credit, 3.
1:00-4:50 M., 1:00-2:50 F. Mr. France, Mr. Perriello.
Prerequisite, Bacteriology 81.

92. (II) Clinical Microbiology

This course is designed for students majoring in medical technology. The purpose of the course is to familiarize the student with routine clinical laboratory procedures.

1 class hour; 1 3-hour laboratory and 1 2-hour laboratory period. Credit, 3.
1:00-1:50 Tu.; 2:00-4:50 Tu., 1:00-2:50 Th. Mr. France.
Prerequisites, Bacteriology 85; Zoology 35, 69.

93. (I) 94. (II) Problems

Qualified seniors who have obtained permission from the department may arrange for independent work on special problems in bacteriology.

Credit, 3.
The Department.

95. (I) Studies of Special Microbial Groups

A study of the biology of certain groups of microorganisms considered only briefly or not at all in other courses offered in the department. The course will cover the autotrophic bacterial, photo-synthetic bacterial, actinomycetes, myxobacteria, chlamydobacteria and spirochaetes.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Mandel.

Prerequisite, Bacteriology 51.

98. (II) Bacterial Physiology

The growth and activities of microorganisms as influenced by the environment and genotype and their effect on the environment. Topics considered include the kinetics of population growth, enzymatic constitution, growth requirements, metabolic pathways, and effects of radiation.

2 class hours; 1 4-hour laboratory period. Credit, 3.
Mr. Mandel.

Prerequisites, Bacteriology 31; Chemistry 79 or equivalent, and permission of the instructor.

PUBLIC HEALTH

61. (I) 62. (II) General and Community Sanitation

A study of the problems of general and community sanitation. Subjects discussed will include insect and rodent control, housing and slum clearance, ventilation, lighting, bathing places, sanitation of eating utensils, nuisances, camp sanitation, industrial hygiene, water supplies, sewerage and sewage, refuse and garbage, food and milk sanitation.

3 class hours. Credit, 3.
10:00-10:50 M. W. F. Mr. Perriello, Mr. Wisnieski.

63. (I) Industrial Hygiene and Sanitation

A comprehensive study of the practices and principles of industrial processes which may constitute problems in sanitation; industrial wastes, smoke abatement, and the health of the worker. Subject matter includes organization of programs and the formation of policies for the inspection of sanitary and mechanical facilities of factories, food processing plants and other industries.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. Perriello.

64. (II) Microscopy of Water

A study of microscopic forms of life exclusive of the bacteria. Counting and control of plankton in potable waters. Elements of limnology.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 M. F.; 8:00-9:50 or 10:00-11:50 W. Mr. Snow.
Prerequisite, Bacteriology 31.

66. (I) and (II) Principles of Sanitation

The application of sanitary engineering and related sanitary sciences to health problems in the environment of urban and rural communities.

2 class hours. Credit, 2.
10:00-10:50 Tu. Th. Mr. Perriello.
Prerequisite, Civil Engineering 77 or permission of the instructor.

84. (II) Public Health Administration

Admission by approval of the instructor. The organization, function, and administration of governmental health agencies; the relationship of official and volunteer health agencies; preparation and presentation of lectures, demonstrations, and exhibits. Public health laws, regulations, and sanitary codes, their origin and enforcement.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. Perriello.

86. (II) Field Studies in Sanitation

Trips will be taken into the field for the observation of public health practices in sewerage; sewage treatment and disposal; the production and purification of public water supplies; housing and slum clearance; insect and rodent nuisances; milk production, handling, and distribution; garbage and refuse collection and disposal; slaughter houses and rendering plants; cold storage ware-

houses; and bakery and restaurant sanitation. A comparative study of urban and rural services will be made. Although transportation will be furnished, students are expected to finance their own meals.

1 class hour; 1 4-hour laboratory period. Credit, 2.
Hours by arrangement. Mr. Wisnieski.
Prerequisites, Public Health 61 and 62.

92. (Summer) Supervised Field Training

All students majoring in sanitary technology must complete a prescribed thirteen-week field training program conducted by the New England Field Training Center under the direction of the Training Division of the Communicable Disease Center, U. S. Public Health Service, with the assistance of the staff and State Department of Health personnel. This course is a prerequisite for placement in federal, state and municipal agencies.

13 weeks. Credit, 6.
The Staff.

88. (II) Epidemiology and Communicable Disease Control

Admission by approval of the instructor. Consideration of the factors involved in the spread of infections; a detailed discussion of the communicable diseases, their distribution, cause, epidemiology, and means of prevention and control. The use of vaccines, serums and drugs for prevention and treatment. Mass immunization programs.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. Lee.

BOTANY

Professor Kozlowski, Professor Livingston, Assistant Professor Banfield, Assistant Professor Putala, Assistant Professor Gentile, Mr. Davis, Mrs. Bergquist.

1. (I) and (II) Introductory Botany

The course sets forth a body of facts dealing with the morphology and physiology of plants which is not only a foundation for future professional work in biological science, but of intrinsic value to the educated layman. The topics of seed germination, ecological adaptations, floral structures, taxonomy, botanical history, cytology, wood-anatomy, plant physiology, and plant reproduction receive appropriate elementary treatment. The lectures attempt to interpret the facts of plant structure and function in the light of the major biological principles.

2 class hours; 1 3-hour laboratory period. Credit, 3.
The Staff.

25. (I) The Plant Kingdom

Selected forms typifying the slimemolds, bacteria, algae, fungi, lichens, liverworts, mosses, fernworts, and seed plants. The course has a two-fold purpose: (1) it is intended for students who desire to extend their knowledge to the principal branches of the plant kingdom, thus rounding out a general course of which Botany 1 constitutes the first part; (2) it is also planned as an introduction to certain advanced courses for which it is prerequisite.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Prerequisite, Botany 1. Mr. Davis.

26. (II) Spring Flora

Designed primarily to acquaint the student with the local spring flora through the identification of the commoner tracheate plants (lycopods, horsetails, ferns, gymnosperms, angiosperms) and the families they represent. In addition, laboratory and field work will include the study of native woody plants in the winter condition; the techniques of collection; and the use of a standard manual in the identification of plants.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
8:00-8:50 W.; 1:00-2:50 Tu. Th. or 1:00-2:50 M. F.
Mr. Livingston.

Prerequisite, Botany 1, Botany 25 recommended.

28. (II) Plant Physiology

Only for students intending to major in forestry. The processes occurring in plants with special emphasis on tree physiology and its relation to forestry problems.

2 class hours; 1 2-hour laboratory period. Credit 3.
Mr. Kozlowski.

30. (II) Plant Anatomy

A study of the origin and structure of vegetative and reproductive organs of seed plants.

2 class hours; 1 2-hour laboratory period. Credit 3.
Mr. Putala.

51. (I) Plant Pathology

A basic course in plant pathology dealing with the nature, cause and control of plant disease. Particular attention is given to disease symptoms, the phenomena of infection and of parasitism, the sources of inoculum, the agents of disease transmission, the relation of environment to disease incidence and development and to general principles of plant disease control. The laboratory phase is devoted to intensive study of a relatively few representative diseases induced by bacteria and fungi of the various classes.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 W.; 3:00-4:50 Tu. Th. Mr. Banfield.

52. (II) Plant Pathology (1956-57)

An extension of Course 51. The objective is that of providing the student with a general knowledge of the more common and representative plant disease problems. Students are granted the option in the laboratory of specializing in disease problems in their major field of interest. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 W.; 3:00-4:50 Tu. Th. Mr. Banfield.

Prerequisite, Botany 51.

58. (II) Microtechnique

A course in the preparation of microscopic mounts including the celloidin and paraffin methods of involving the use of microtomes and of differential stains. Enrolment limited to ten students.

2 2-hour laboratory periods. Credit, 2.
1:00-2:50 Tu. Th. Mr. Putala.
Prerequisite, Botany 2[illegible]

59. (I) 60. (II) The Angiosperms (1956-57)

Alternate with Courses 61 and 62. The angiosperms are here treated from the standpoints of their structure and evolution, their taxonomy, their habits and distribution, and their economic or other special appeal to man's interests. Representatives of the dominant families, both temperate and tropical, are studied in the laboratory. The course is designed for students who want a broad knowledge of the flowering plants of the world.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Prerequisite, Botany 1. Mr. Davis.

61. (I) 62. (II) The Comparative Antomy of Green Plants (1957-58)

Alternate with Courses 59 and 60. The first semester is devoted to algae and mosses; the second to tracheates, including the extinct forms.

2 class hours; 1 2-hour laboratory period. Credit, 3.
10:00-10:50 M. F.; 1:00-2:50 W. The Staff.
Prerequisite, Botany 25.

63. (I) Comparative Morphology of Fungi—Basidiomycetes and Fungi Imperfecti (1958-59)

The lectures deal with the comparative morphology, life history, and habitat of representative species of the important orders and families. The laboratory periods are devoted to the collection, identification, and study of common local forms. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 F.; 3:00-4:50 M. F. Mr. Banfield.

64. (II) Comparative Morphology of Fungi Phycomycetes and Ascomycetes (1957-58)

The lectures deal with the comparative morpology, life history, and habitat of representative species of the important orders and families. The laboratory periods are devoted to the collection, identification, and study of common local forms. Given in alternate years.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu.; 10:00-10:50 Th.; 3:00-4:50 M.
Mr. Banfield.

66. (II) General Mycology

A survey course in mycology designed to acquaint the student with the various classes of fungi, their distribution in nature, their significance in plant and animal disease, their utilization in industral fermentations. The laboratory phase is devoted to a study of common representative forms and practice in the use of keys for their identification.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
11:00-11:50 Tu.; 3:00-4:50 Tu. Th. Mr. Banfield.

67. (I) 68. (II) Introductory Plant Physiology

A study of the processes occurring in plants and their relation to the complex of activities constituting plant growth. Topics include colloidal systems,

osmotic phenomena, absorption, transpiration, and internal water relations of plants, photosynthesis, fat and protein synthesis, digestion, translocation, respiration, and growth. This is a basic course for students planning for advanced work in any branch of plant science.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
10:00-10:50 W.; 3:00-4:50 M. W. or Tu. Th. Mr. Kozlowski.

69. (I) Forest and Shade Tree Pathology

The nature, cause and control of the principal types of disease in trees, including decay of forest products, standing and structural timber; insects and environment in relation to fungi and disease development; morphology and identification of fungi that induce disease or decay in trees.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. Banfield.

75. (I) Methods in Plant Pathology (1956-57)

A course in the general techniques and specialized methods used in the investigation of plant diseases, including isolation, culture and pathogenicity studies of representative plant pathogenes, the preparation and sterilization of various culture media, elementary staining and histological techniques, the use of the microscope, study of fungicides, and training in elementary photographic procedures. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
2:00-2:50 Tu.; 10:00-11:50 Tu.; 3:00-4:50 F. Mr. Banfield.
Prerequisite, Botany 51.

77. (I) 78. (II) Advanced Plant Physiology

Advanced study in physiology.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Hours by arrangement. Mr. Kozlowski.
Prerequisites, one semester of plant physiology.

81. (I) Plant Ecology

A general survey of the relationship of plants to their environment including a study of environmental factors (autecology)—soil, water, temperature, light, atmosphere, and the biotic factors—and of plant communities (synecology) with special emphasis on the structure and succession of plant communities in North America.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Livingston.

Prerequisite, Botany 1; Botany 26 recommended.

82. (II) Plant Geography

A survey of descriptive and historical plant geography as well as the basic principles governing the natural distributions of plants. Included as topics are problems of dispersal and migration, endemism, species senescence, discontinuous distributions, polyphlesis, continental drift, and geographical aspects of polyploidy. The course is designed for advanced undergraduates or qualified graduate students.

2 class hours. Credit, 2.
Mr. Livingston.

Prerequisite, Botany 81 or equivalent recommended.

85. (I) 86. (II) Problems in Botany

Supervised problem work for qualified students.

Hours by arrangement. Credit, 1-3.

The Staff.

89. (I) Plant Cytogenetics

The interpretation of hereditary phenomena in plants in terms of cell structures. A correlation of plant cytology and genetics which is of applied as well as theoretical importance.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

The Staff.

90. (II) Insect Transmission of Plant Diseases

The intricate interrelationships of insects and microorganisms with particular emphasis on the basic role played by insects in inception, distribution and perpetuation of plant diseases.

3 class hours. Credit, 3.

Mr. Banfield.

BUSINESS ADMINISTRATION

Professor Kimball, Professor Hardy, Professor Colwell, Professor O'Donnell, Associate Professor Smart, Associate Professor Ludtke, Associate Professor Singer, Associate Professor Unger, Assistant Professor Rivers, Assistant Professor Lentilhon, Assistant Professor Hackamack, Assistant Professor Anderson, Assistant Professor Drew-Bear, Mr. Zane, Mr. Fitzgerald.

ACCOUNTING

25. (I) Introduction to Accounting I

An introduction to the principles underlying the collection, recording, and interpretation of accounting data.

2 class hours; 2 1-hour laboratory periods. Credit, 3.

Mr. Colwell, Mr. Anderson, Mr. Fitzgerald, Mr. Lentilhon, Mr. Singer.

26. (II) Introduction to Accounting II

An introduction to the principles and procedures of accounting for corporations, partnerships and manufacturers.

2 class hours; 2 1-hour laboratory periods. Credit, 3.

Mr. Colwell, Mr. Anderson, Mr. Fitzgerald, Mr. Lentilhon, Mr. Singer.

Prerequisite, Accounting 25.

61. (I) Intermediate Accounting

An application of accounting principles to problems of income determination and the classification and valuation of assets.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Prerequisite, Accounting 26.

Mr. Lentilhon, Mr. Singer.

62. (II) Advanced Accounting

A continuation of Accounting 61, concerned with the valuation of assets and liabilities, accounting for net worth, statements of application of funds and the analysis of financial statements.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Singer.

Prerequisite, Accounting 61.

64. (II) Cost Accounting

The use of accounting techniques to determine business costs, including process costs, standard costs, distributive costs and cost problems imposed by government regulation.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Lentilhon.

Prerequisite, Accounting 26.

73. (I) Federal Income Tax Procedure

A study of federal income tax laws and regulations as they affect individuals; the preparation of tax returns; a study of federal security taxes.

3 class hours. Credit, 3.

Mr. Anderson.

Prerequisite, Accounting 26.

74. (II) Advanced Accounting Problems

The application of accounting procedures to representative types of business including mechanized accounting.

3 class hours. Credit, 3.

Mr. Anderson.

Prerequisite, Accounting 64.

75. (I) Administrative Accounting and Control

The preparation and analysis of budgets, reports, and internal checks, using accounting techniques as control devices in business and industry.

3 class hours. Credit, 3.

Mr. Colwell, Mr. Singer.

Prerequisite, Accounting 64.

76. (II) Auditing

A course in the verification of accounting records dealing with audit theory and procedure.

3 class hours. Credit, 3.

Mr. Colwell.

Prerequisites, Accounting 62 and 64.

FINANCE

55. (I) Financial Institutions

A general course which surveys the development and operations of our financial institutions and provides an integrated study of the entire American financial structure.

3 class hours. Credit, 3.

Mr. Kimball, Mr. Ludtke, Mr. Unger.

65. (I) and (II) Corporation Finance

This course in business finance is concerned with the nature and uses of corporate securities, provision and maintenance of capital, financial expansion, and corporate reorganization.

3 class hours. Credit, 3.

Mr. Kimball, Mr. Ludtke, Mr. Unger.

76. (II) Insurance

A general course concerning risks encountered by individuals and business enterprises and the methods and institutions evolved to insure against loss. Property, casualty, life and other forms of insurance are studied from the point of view of both the insurance carrier and the insured.

3 class hours. Credit, 3.

Mr. Ludtke.

81. (I) Problems in Business Finance

A study of problems of financial management of various types of business enterprises and the formation of their financial policies.

3 class hours. Credit, 3.

Prerequisite, Finance 65 or consent of instructor. Mr. Ludtke.

82. (II) Investments

The principles and techniques that are useful for the analysis and selection of investment media; investment policies of individuals and institutions.

3 class hours. Credit, 3.

Prerequisite, Finance 65 or consent of instructor. Mr. Ludtke.

GENERAL BUSINESS MANAGEMENT

53. (I) Office Procedures

This course provides instruction and laboratory practice in office organization and procedures and the operation of office machines. Not offered 1956-57.

1 class hour; 4 1-hour laboratory periods. Credit, 3.

The Department.

54. (II) Office Procedures

A continuation of Course 53, including the use of systems and records as managerial aids in the business office. Not offered 1956-57.

1 class hour; 4 1-hour laboratory periods. Credit, 3.

The Department.

GENERAL BUSINESS MANAGEMENT

70. (I) and (II) Business Law I

This course consists of a study of the drawing, and interpretation of contracts, and includes agency, sales, and commercial paper.

3 class hours. Credit, 3.

Mr. Smart, Mr. Shea.

72. (II) Business Law II

A continuation of Business Law 70 including the study of the legal aspects of business organization and some laws of public regulation.

3 class hours. Credit. 3.

Mr. Smart.

Prerequisite, Business Law 70.

80. (II) Administrative Procedure

Theory and practice of administrative organization; planning and direction in business situations; formation and execution of business policies; coordinated and effective operations through group action.

3 class hours. Credit, 3.

Mr. O'Donnell.

INDUSTRIAL ADMINISTRATION

11. (I) Industrial Geography

A study of the distribution of natural and human resources and the industrial and physiographic bases of the extractive and manufacturing industries.

3 class hours. Credit, 3.

Mr. Hackamack, Mr. Rivers, Mr. Zane.

63. (I) Management in Industry

A study of the principles connected with the organization and management of industrial enterprises.

3 class hours. Credit, 3.

Mr. O'Donnell, Mr. Hackamack, Mr. Rivers.

64. (II) Personnel Management

A study of the principles of the management of labor relations. Attention is focused on procuring, developing, maintaining and using personnel.

3 class hours. Credit, 3.

Mr. Hackamack, Mr. Rivers.

66. (II) Transportation and Traffic

The development of highway, waterway, railway, and air transportation; the operation and control of transportation agencies; the use of freight tariffs, classifications and routing guides; the functions of industrial traffic departments.

3 class hours. Credit, 3.

Mr. Rivers.

73. (I) Problems of Industrial Management

An intensive analysis, through study of actual cases, of the problems that confront managers in the manufacturing division of a business.

3 class hours. Credit, 3.

Mr. O'Donnell.

Prerequisite, Industrial Administration 63.

MARKETING

53. (I) Marketing Principles

Not open to students who have taken or are taking Agricultural Economics 55. A study of the institutions, methods, and problems concerned with the distribution of industrial and consumer goods.

3 class hours. Credit, 3.

Mr. Hardy, Mr. Drew-Bear, Mr. Zane.

54. (II) Salesmanship and Sales Management

The principles and practices of selling; the management of sales personnel; and the control of sales operations.

3 class hours. Credit, 3.

Mr. Hardy.

62. (II) Market Research

The aims, sources and fact-gathering methods of market research activities. General study and individual research projects.

3 class hours. Credit, 3.

Mr. Drew-Bear.

71. (I) Retail Merchandising

A study of the operation and productive functions of the business of retailing.

3 class hours. Credit, 3.

Mr. Drew-Bear.

73. (I) Advertising

A study of the techniques and media of advertising, its services to business and the organization and economic functions of the advertising industry.

3 class hours. Credit, 3.

Mr. Hardy.

74. (II) New England Markets

Individual and group study of the marketing problems of New England industrial enterprises. Not offered 1956-57.

3 class hours. Credit, 3.

Mr. Hardy.

76. (II) Purchasing

A study of the purchasing organization and practices of industrial enterprises.

3 class hours. Credit, 3.

Mr. Zane.

80. (II) Problems in Marketing

A study of problems of market management, especially the interrelation between research planning and the execution of sales programs. Effects of various marketing policies upon individual firms and the industry are examined.

3 class hours. Credit, 3.

Mr. Drew-Bear.

Prerequisite, Marketing 53.

CHEMISTRY

Professor Ritchie, Professor Smith, Professor Cannon, Professor Little, Associate Professor Richason, Associate Professor Roberts, Associate Professor Stein, Assistant Professor McWhorter, Assistant Professor Carpino, Assistant Professor Stidham, Mr. Oberlander, Mr. Tyler, Miss Kendrow, Miss Judge, Mr. Levitt, Mrs. Fessenden, Mr. Fisher, Mr. Turner, Mr. Sannella.

1. (I) 2. (II) General Chemistry

A study of the fundamental chemical laws and theories. A considerable amount of descriptive material will be included in connection with discussions of the periodic system, atomic structure, and in various applications of the principles. The object of the course is to give the student a sound scientific training through a course in chemistry. Students who have had no previous work in chemistry will be grouped together in recitation sections so that they may have special attention.

2 class hours; 1 quiz hour; 1 2-hour laboratory period. Credit, 3.
Mr. Stidham, Mr. Richason, Mr. Stein, Mr. Oberlander.

4. (II) General Inorganic Chemistry

For students planning to major in chemistry or chemical engineering, and others who plan to continue the study of this science in preparation for their field of specialization. The course will include ionic equilibria; oxidation and reduction; electro-chemistry; the descriptive chemistry of some nonmetallic and metallic elements; the metallurgy of some common metals, and a discussion of the production of some of the more important inorganic chemicals. Applications of atomic structure and the electronic theory of valence to these subjects will be stressed.

2 class hours; 1 quiz hour; 2 2-hour laboratory periods. Credit, 4.
Mr. Stidham, Mr. Richason.

Prerequisite, Chemistry 1.

29. (I) and (II) Qualitative Analysis

A study of the fundamental principles and laws concerning the behavior of solutions of electrolytes. The laboratory work deals with the characteristic properties, reactions, and the systematic separation and identification of the common cations and anions. The semi-micro technique is used throughout for the analysis of salts, salt mixtures, and alloys. A considerable portion of the laboratory work is devoted to the identification of substances unknown to the student. This course is designed to meet the needs not only of those students specializing in chemistry, but also of those students specializing in other subjects where inorganic chemistry is of importance.

2 class hours; 6 laboratory hours. Credit, 4.
8:00-8:50 or 10:00-10:50 Tu. Th.; 8:00-9:50 or 10:00-11:50 M. W. F. or 1:00-3:50 M. F. or 1:00-3:50 Tu. Th. Mr. Smith, Mr. Levitt.

Prerequisites, Chemistry 2 or 4.

30. (I) and (II) Quantitative Analysis

The theory and practice of representative determinations in gravimetric and volumetric analysis are considered in detail together with analytical calculations.

The laboratory work emphasizes the techniques required for accurate chemical measurements.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
10:00-10:50 Tu. Th.; 1:00-3:50 M. F. or Tu. Th. or 1:00-3:50 W., 9:00-11.50 S.
Mr. Roberts.

Prerequisite, Chemistry 29.

33. (I) and (II) Organic Chemistry

A short course intended to satisfy the requirements in this field for all students who do not specialize in chemistry.

3 class hours; 1 3-hour laboratory period. Credit, 4.
9:00-9:50 Tu. Th. S.; 1:00-3:50 M. T. W. or Th. Mr. Carpino.
Prerequisites, Chemistry 1 and 2.

51. (I) 52. (II) Organic Chemistry

A course in the theory of organic chemistry intended to serve the needs of students who will specialize in chemistry, as well as those who may specialize in other fields where a more comprehensive course is desired than Chemistry 33. The first semester deals largely with compounds of the aliphatic series, while the benzene series is taken up in the second semester. Students electing this course should take both 51 and 52.

3 class hours; 1 3-hour laboratory period. Credit, 4.
9:00-9:50 M. W. F.; 1:00-3:50 M. W. or F. Mr. Ritchie, Mr. McWhorter.
Prerequisite, Chemistry 29.

63. (I) Chemistry of Water, Sewage and Sewage Sludge

Admission by permission of the instructor. The preparation of reagents and standard methods for the analysis of water, sewage and sewage sludge. Lectures and discussions on the sanitary significance of analytical data.

2 3-hour laboratory periods. Credit, 3.
1:00-3:50 W.; 9:00-11:50 S. Mr. Snow.
Prerequisite, Chemistry 30.

65. (I) 66. (II) Physical Chemistry

A study of the fundamental theories and laws of physical chemistry, together with the solution of problems involved in their application. The laboratory work will include practice in making physico-chemical measurements and the preparation of reports.

3 class hours; 1 3-hour laboratory period. Credit, 4.
8:00-8:50 or 11:00-11:50 M. W. F.; 1:00-3:50 M. W. or F.
Mr. Smith, Mr. Stein, Mr. Fisher.

Prerequisites, Chemistry 30; Mathematics 30; Physics 26.

77. (I) Advanced Physical Chemistry

A detailed study of a number of topics such as kinetics, catalysis, chemical thermodynamics and electrochemistry.

3 class hours. Credit, 3.
Mr. Stein.

Prerequisites, Chemistry 65 and 66.

79. (I) Elementary Biochemistry

A consideration of the more important facts relating to biological materials and processes. This course is designed primarily for students not eligible for courses 93 or 94. It is not open to chemistry majors and is not offered for graduate credit.

3 class hours; 1 3-hour laboratory period. Credit, 4.
Mr. Little.

Prerequisite, Chemistry 33 or 51.

80. (II) Clinical Chemistry (Blood and Urine Analysis)

Work to be covered will include the collection and preparation of samples for analysis; standardization of glassware and the preparation of reagents; description of colorimeters and the determination of certain significant compounds in the samples. The latter group will include at least sugars, proteins, non-protein, nitrogen, fatty substances and inorganic elements.

1 class hour; 1 3-hour laboratory period. Credit, 2.
Mr. Little.

81. (I) Organic Chemistry

A rapid and intensive survery of the important reactions of organic chemistry with emphasis on their scope and limitations, recent developments and theoretical aspects. Admission by permission of instructor.

3 class hours. Credit, 3.
9:00-9:50 Tu. Th. S. Mr. Cannon.
Prerequisite, one year of organic chemistry.

82. (II) Qualitative Organic Chemistry

The characterization of organic compounds by means of physical properties, class reactions and the preparation of suitable derivatives. The laboratory work will involve the identification of a number of simple unknown compounds followed by the separation, purification, and identification of the individual components in several unknown mixtures of organic compounds. Admission by permission of instructor.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
1:00-1:50 Tu. Th.; 2:00-4:50 Tu. Th. Mr. Cannon.
Prerequisite, one year of organic chemistry.

83. (I) Advanced Analytical Chemistry

The theory and techniques of special methods of analysis such as colorimetry, potentiometry, microscopy, ion exchange, electro-deposition and other recently developed methods of analysis. Primarily for chemistry majors but open to others with the permission of the instructor.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. Roberts.

Prerequisite, Chemistry 30.

86. (II) Theoretical Inorganic Chemistry

A survey of inorganic chemistry which is largely theoretical and includes such topics as atomic structure, periodic classification and relationships, valence

concepts, acid-base theory, and the chemistry of the commercially important elements and their compounds based upon the periodic table.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. Smith.
Prerequisite, Chemistry 65.

88. (II) History of Chemistry

An historical and biographical study of chemistry and chemists. The aim of the course is: (1) to give the student a comprehensive view of the science as a whole, through a study of the development of new ideas and the establishment of new theories and laws; and (2) to arouse an enthusiastic interest in the subject and an appreciation of the true spirit of scientific research, through a sympathetic presentation of the work and lives of the great chemists who have been the creators of the chemistry of today.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. Ritchie.

92. (II) Introduction Research

Admission only by permission of the department. The aim of the course is to give the student an opportunity to learn the purpose and methods of research. To each student is assigned some special subject or problem in one of the following fields of chemistry, viz., analytical, biochemical, inorganic, organic, physical.

10 laboratory hours. Credit, 5.
Hours by arrangement. The Department.

93. (I) 94. (II) General Biochemistry

These courses offer a broad introduction to the general field of biochemistry for students majoring in chemistry or in the biological sciences, and provide a background for more advanced or specialized study in this field.

3 class hours; 1 3-hour laboratory period. Credit, 4.
Mr. Little.

Prerequisites, Chemistry 51 and 52 or their equivalent.

DAIRY AND ANIMAL SCIENCE

Professor Hankinson, Professor Foley, Professor Gaunt, Associate Professor Black, Assistant Professor Elliot†, Assistant Professor Baker, Assistant Profesor Potter, Assistant Professor Greenstein, Assistant Professor Evans, Assistant Professor Wittwer, Mr. Adams, Mr. Hobart.

ANIMAL HUSBANDRY

2. (II) Breeds of Livestock

This course considers the economic desirability of thirty breeds of domestic livestock. The origin, history, characteristics and distribution of the breeds of cattle, sheep, swine, and horses commercially important in the United States will be discussed.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Elliot.

† On leave of absence.

26. (II) Dairy Cattle Type Evaluation

An intensive study of dairy cattle type and its importance. The relationship of type to longevity and milk production will be discussed. During April and May trips to leading dairy cattle establishments will be made on Saturdays, cost of such trips approximately $15.00.

1 2-hour laboratory period, February and March. Credit, 1.
1 4-8-hour laboratory period, April and May. Mr. Elliott.

33. (I) Elements of Meat Packing

For department majors only. The lectures will discuss the development of the modern packing industry, the history of meat inspection, the principles of meat preservation and the opportunities in this field. Laboratories include the classification of cattle, calves, and swine into proper market classes and grades and slaughtering and dressing operations with animals provided by the university farm. Wholesale and retail cuts are prepared. A one-day trip through the packing plants of Boston is a requirement of this course and will cost about $5.00.

1 class hour; 1 4-hour laboratory period. Credit, 3.
Mr. Hobart.

51. (I) Fundamentals of Animal Nutrition

This course is planned to acquaint the student with the fundemental principles of animal nutrition. It includes a study of the nature and functions of the food nutrients and the nutritive requirements for maintenance, growth, reproduction, lactation, and other body functions. Emphasis will be on ruminants and swine.

3 class hours. Credit, 3.
Prerequisite, Chemistry 33. Mr. Wittwer.

52. (II) Feeds and Feeding

The fundamental principles of nutrition are applied to practical livestock feeding. This course includes methods of feed evaluation, feeding standards, formulation of rations under varying conditions, and the composition and nutritive value of livestock feeds.

2 2-hour laboratory periods. Credit, 2.
Prerequisite, Animal Husbandry 51. Mr. Wittwer.

54. (II) Meat Processing

For students not majoring in animal husbandry, by permission of the instructor. A few periods will be devoted to a discussion of the meat packing industry and to the preserving and care of meat products. The remainder will be spent on the classification of meat animals with practice slaughtering and the making of wholesale and retail cuts with stress on identification of retail cuts. A one-day trip through the packing plants of Boston is a requirement of this course and will cost about $5.00.

1 4-hour laboratory period. Credit, 2.
Mr. Adams.

56. (II) Beef and Sheep Production

This course considers the historical and economic development, present status and probable future trends of beef and sheep production in the United States and especially in New England. Consideration will be given to types of production; systems and methods of feeding, management and marketing. In the

laboratory, practice will be obtained in fitting and showing as well as certain practical techniques such as dehorning, ear-tagging, castrating, foot-trimming, shearing, etc., and the treatment and prevention of external and internal parasites as well as common ailments.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Baker.

58. (II) General Livestock Evaluation

This course acquaints the student with the methods of evaluation and selection which combine both the records and physical appearance of the animals. Demonstrations of production-testing methods will be set up and conducted by the students. Field trips will be made to nearby livestock farms, at an estimated cost to the student of $20.00.

1 4-hour laboratory period. Credit, 1.
Mr. Baker.

65. (I) Reproduction in Farm Animals

This course deals with the comparative aspects of anatomy, embryology, endocrinology and physiology of the reproductive system of farm mammals, concepts of fertility and sterility, and practice in semen collection, artificial insemination and pregnancy diagnosis. A field trip to Shrewsbury to observe operations of the M. S. B. A. bull stud is a requirement of the course and should not exceed $2.00 in cost.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Black.

66. (II) Animal Breeding

This course is designed to acquaint the student with the workings of heredity and variation in farm mammals and the role of breeding systems and selection procedures in animal improvement, and breeding systems in genetic improvement of livestock.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Prerequisite, Zoology 53. Mr. Gaunt.

72. (II) Classes and Grades of Meat

This course deals with the classification, grading and judging of carcasses and cuts of beef, veal, lamb and pork. Class work will be carried on at the abattoir and nearby packing and distributing plants. Cost of necessary trips should not exceed $5.00.

1 4-hour laboratory period. Credit, 1.
Mr. Adams.

74. (II) Advanced Meats

This course deals with the advanced techniques in preparing, preserving, and utilizing the various meat products from cattle, sheep and swine.

2 2-hour laboratory periods. Credit, 2.
Mr. Hobart.

Prerequisites, Animal Husbandry 33 or 54 and permission of instructor.

77. (I) 78. (II) Dairy Cattle Production

This is an intensive course covering all phases of dairy cattle and milk production. It affords an opportunity to seek the solution to the economic, nutritional, genetic and managerial problems concerned in successful dairying.

Field trips to leading dairy establishments are components of these courses, the cost to be $10.00 in the fall semester and $20.00 in the spring semester.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Foley.

79. (I) Horse and Swine Production

Light horses are emphasized in the horse production portion of the course. The feeding, breeding, training and some equitation are covered. Each student is required to care for a mare for one week. The material devoted to swine husbandry attempts to correlate all management practices and to analyze the various methods of production with emphasis on New England conditions. Field-trip cost will not exceed $5.00.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Baker.

81. (I) 82. (II) Seminar

For Animal Husbandry majors.

1 2-hour laboratory period. Credit, 1.
The Staff.

DAIRY TECHNOLOGY

25. (I) General Dairying

This course is introductory to all other courses in dairy industry and gives a general knowledge of the subject to those who wish to take only one course in dairying. The lecture portion includes the importance of the dairy industry, the composition and properties of milk, the secretion of milk, production of quality milk on the farm, methods of processing milk and cream, and the elements of ice cream, butter and cheese making. The laboratory work includes the testing of milk and milk products for fat and acidity, lactometry, and a general study of dairy plant equipment and processes.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Hankinson.

50. (II) Judging Dairy Products

A study of market standards and grades of dairy products, with practice in judging milk, ice cream, butter, and cheese. The emphasis is on recognizing quality in dairy products, detecting specific defects, and learning the causes and means of preventing common defects. A team is chosen from this class to represent the University in two contests: Eastern States Intercollegiate Dairy Products Judging Contest, and Collegiate Students' International Contest in Judging Dairy Products.

1 2-hour laboratory period. Credit, 1.
Mr. Potter.

52. (II) Market Milk

A study of the various phases of the market milk industry; sanitary production, transportation, pasteurization and handling in the city plant; marketing, delivery systems, milk and its relation to public health, inspection, milk laws, food value, and advertising. Cultured milk and other milk drinks also are included. Some milk plants are visited, the cost of the trip not exceeding five dollars.

2 class hours; 2 2-hour laboratory periods. Credit, 4.
Mr. Evans.

75. (I) Dairy Chemistry

This course is a particular study of those physical and chemical principles which not only explain the behavior of milk and milk products in the various technological operations, but also provide a basic viewpoint for dairy research. The lectures will include discussions (1) of the constituents of milk in relation to other organic compounds, and (2) the physiochemical aspects of certain dairy phenomena such as foaming, coagulation, etc. The laboratory work will include many of the tests used commercially and in dairy research, emphasizing the principles and application of both qualitative and quantitative analysis as well as the technique of operating scientific apparatus.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Potter.

77. (I) Butter and Cheese Making

Half of the semester is devoted to butter making; the remainder to cheese making, condensed and powdered milk. The various phases of the butter industry studied are: separators and cream separation; pasteurization, neutralization, and ripening of cream; preparation of starter cultures; churning; marketing and scoring of butter; creamery management. The work in cheese making includes cheddar, cream, Neufchatel, cottage, processed cheeses, etc. The manufacture of condensed milk, powdered milk, and commercial casein is also covered.

2 class hours; 2 3-hour laboratory periods. Credit, 4.

Mr. Evans, Mr. Potter.

78. (II) Ice Cream Making

The course includes a study of the principles and practices of ice-cream making. The effects of such factors as composition, quality, pasteurization, homogenization, aging, and freezing on the finished products are considered. Sherbets, ices, fancy and individual forms, and all flavors of ice cream are studied. Some time is devoted to refrigeration, machinery, delivery equipment, and merchandising methods as they are related to the industry.

2 class hours; 2 3-hour laboratory periods. Credit, 4.

Mr. Potter.

79. (I) 80. (II) Seminar

For students specializing in dairy technology.

1 class hour. Credit, 1.

The Department.

ECONOMICS

Professor Gamble, Professor Morris†, Associate Professor Schoeffler†, Associate Professor Howard, Associate Professor Vatter, Assistant Professor Levinson, Mr. Will, Mr. Campbell, Mr. Kinsey.

12. (II) Economic History of the United States

A study of the significant factors in the economic development of the nation.

3 class hours. Credit, 3.

Mr. Will, Mr. Levinson.

†On leave of absence.

25. (I) and (II) Elements of Economics

Definitions and introductory principles of production, exchange, and the financial organization of society, with a short survey of the economics of distribution and the use of wealth and income.

3 class hours. Credit, 3.

THE DEPARTMENT.

26. (II) Problems of the National Economy

A continuation of course 25. Current problems, including international economic relations, the determination and distribution of the national income, and the place of economic planning in peace and war are discussed.

3 class hours. Credit, 3.

Prerequisite, Economics 25. THE DEPARTMENT.

53. (I) Money, Banking and Credit

A critical survey of the development and operation of the monetary and banking systems of the United States.

3 class hours. Credit, 3.

MR. GAMBLE.

54. (II) Money, Income and Monetary Policy

A study of the relationship between money, income and monetary policy. It includes examination of the relationships between individuals, banks, money markets and central banks.

3 class hours. Credit, 3.

MR. GAMBLE.

Prerequisite, Economics 53 or Finance 53.

55. (I) Economics of Consumption

A study of patterns of consumption, standards of living and the sources and expenditure of individual and family incomes.

3 class hours. Credit, 3.

MR. MORRIS.

56. (II) Business Fluctuations and Forecasting

A study of business fluctuations and an analysis of current business cycle theories.

3 class hours. Credit, 3.

MR. HOWARD.

70. (II) The Structure of American Industry

A study of enterprise, market competition and economic development in American industries.

3 class hours. Credit, 3.

MR. HOWARD.

73. (I) Modern Economic Theory and Analysis

An analysis of the mode of operation of a non-controlled free-enterprise economy. The principles of rational economic planning by business firms; the operation of various types of markets; and the balancing of conflicting forces in the entire economy.

3 class hours. Credit, 3.

MR. SCHOEFFLER, MR. VATTER, MR. LEVINSON, MR. CAMPBELL.

74. (II) Current Economic Problems

An advanced course for those desirous of studying more intensively some current economic problems. Students will be encouraged to pursue lines of individual interest.

3 class hours. Credit, 3.

Mr. Levinson.

77. (I) Economics of International Trade (1958-59)

A study of the policies, principles, and practices of international trade. Given in alternate years.

3 class hours. Credit, 3.

Mr. Kinsey.

78. (II) Public Finance

Principles of public revenues and expenditures with special emphasis on the systems and problems of taxation.

3 class hours. Credit, 3.

Mr. Gamble.

79. (I) Labor Problems

An analysis of the background and character of the modern labor problem with special reference to the United States. Topics to be considered include: the problems of wages, hours, working conditions and unemployment; the trade union movement; and some agencies for the promotion of industrial peace.

3 class hours. Credit, 3.

Mr. Morris, Mr. Will.

80. (II) Labor Legislation

The development of American legislation with respect to labor and labor organizations as seen in its historical and social context, and in its current application.

3 class hours. Credit, 3.

Mr. Will.

83. (I) Social Control of Business

Methods of social control of economic activity including both formal and informal controls. The efforts to maintain, supplement, and moderate competition, and the substitution of regulation or public enterprise for competition.

3 class hours. Credit, 3.

Mr. Howard.

84. (II) Comparative Economic Systems

An examination of the various forms of economic organization that have been tried and proposed with an analysis of the economic institutions of representative current economies.

3 class hours. Credit, 3.

Mr. Schoeffler.

91. (I) 92. (II) Seminar

Research in economic theory; problems of labor, commerce, and industry. If desirable, some other economic study may be substituted.

1 or 2 2-hour conferences. Credit, 1 to 3.

The Department.

EDUCATION

Professor Purvis, Associate Professor Oliver, Associate Professor Wyman, Assistant Professor Rourke, Assistant Professor O'Leary, Assistant Professor Fennell, Assistant Professor Trumbull, Assistant Professor Adams, Mr. Curtis, Miss McManamy, Mr. Taft[1], Visiting Lecturer McCaffrey.

51. (I) and (II) History of Education

Educational movements are traced from early Greece to the present with the aim of better understanding of modern problems. Special emphasis is placed upon the function of the school in the various societies.

3 class hours. Credit, 3.

Mr. Purvis, Mr. Adams.

52. (II) Principles and Methods of Teaching

By means of discussion, case studies, and current educational literature, teaching ideals and procedures are set up. Application of the general principles are made in the major fields represented by the class. Given also in the concentrated secondary block.

3 class hours. Credit, 3.

Mr. Fennell.

53. (I) Educational Tests and Measurements

The most serviceable tests and scales for measuring achievement are considered; test construction, administration, scoring, and interpretation of results are studied and practiced. Considerable attention is given to preparation of informal tests for diagnostic and grading purposes.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Rourke.

60. (I) and (II) Elementary School Curriculum

This course is designed to present a picture of the elementary school curriculum from the standpoint of content and methodology. Emphasis will be placed on the unit method and the activity program. Given only in the concentrated elementary block.

3 class hours. Credit, 3.

Mrs. Trumbull.

61. (I) and (II) Teaching of Elementary Reading and Language Arts

The main emphasis will be placed upon a development program in reading instruction. Discussions, demonstrations, and principles of effective reading practices will form a major part of the course. Methods of teaching oral and written language will be included. Given only in the concentrated elementary block.

3 class hours. Credit, 3.

Miss O'Leary.

62. (I) and (II) Teaching of Elementary Arithmetic

This course will discuss and demonstrate accepted methods and materials in the teaching of arithmetic in the elementary grades. Attention will be given to methods of correlating arithmetic with the total program of the school. Given only in the concentrated elementary block.

3 class hours. Credit, 3.

Mrs. Trumbull.

[1] State Supervisor for Agricultural Teacher-Training representing the State Department of Education in the administration of vocational agricultural acts.

64. (I) and (II) Principles of Elementary Education

This course is designed to acquaint the student with the aim, organization, program, pupil population, etc., of the elementary school and the relationship between this level of education and the secondary school level which follows.

3 class hours. Credit, 3.

Miss McManamy.

66. (I) and (II) Preparation and Use of Audio-Visual Aids

Study is made of available media of audio-visual aids to instruction, construction of visual material, and accepted methods of use.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Wyman, Mr. Curtis.

72. (I) Vocational Education in Agriculture

This course demands certain requisites of experience and a definite objective on the part of the student to enter the field of vocational agricultural teaching which makes it necessary for the student to seek permission to enter the course. It is the first of the series of special courses (72, 73, 75) required of candidates for the vocational teacher-training certificate. A survey of vocational agricultural education and an introduction to teaching of vocational agriculture at the secondary school level is the basis of the course. Certain information and observations in preparation for the apprenticeship course are offered.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Oliver and Vocational Division of State Department of Education.

73. (I) and (II) Apprentice Teaching in Agriculture

For a limited number of qualified candidates in vocational agriculture education. A full year in absentia normally following the junior year in college, teaching agriculture, horticulture, and related subjects. Candidates should have completed the course in Education 72, and in Education 75, if possible and must apply before April 1 to the instructor of the course.

Maximum Credit, 6.

Mr. Oliver and Vocational Division of State Department of Education.

75. (II) Technique of Teaching Vocational Agriculture

This course covers the materials, methods, policies, and special requirements of Massachusetts for teaching vocational agriculture and related subjects in high schools and special country schools. This is one of three courses required of candidates for agricultural teacher training certificates.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Oliver and Vocational Division of State Department of Education.

Prerequisite, Education 72 or permission of the instructor.

79. (I) Methods in Adult Education

Admission only by permission of instructor. The beginning Education course for juniors and seniors who are training for extension work and for others interested in teaching adults. Generally accepted methods of group and individual instruction with adults, and methods of developing leaders to carry on the work in the field.

2 class hours; 1 2-hour laboratory period. Credit, 3.

The Department.

81. (Summer) Teaching Foreign Language in Elementary School

The latest techniques, methods, and materials will be presented by instructors from the Departments of Education and Foreign Language. For trainees in elementary education or elementary teachers who have a major in foreign language.

5 periods a week for 6 weeks. Credit, 3.

The Cooperating Departments.

83. (I) Principles of Secondary Education

This course presents a picture of the secondary school as a social agency, its relation to elementary and collegiate education, its aims, organizations, administration, curriculum procedures, and such other phases as are necessary to acquaint the student with the predominant level of our education ladder.

3 class hours. Credit, 3.

Mr. Fennell.

85. (I) and (II) Observation and Practice Teaching

Admission by permission of the Department. An opportunity to do regular teaching in cooperating schools within commuting distance of the University. The student works under the supervision of a teacher with frequent visits from some member of the university staff. Given only in the concentrated elementary and secondard blocks. Credit, 3-6.

The Department.

Prerequisites for secondary school teaching: Education 51, Psychology 56 or their equivalent; for elementary school teaching: Education 51, 64, and Psychology 94 or Home Economics 70.

88. (I) and (II) Secondary School Curriculum

A consideration of learning material and activities and their organization in the subjects which these students are teaching, and the preparation of courses of study in those fields in the light of accepted educational practices. Given also in the concentrated secondary block.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Rourke.

CHEMICAL ENGINEERING

Professor Lindsey, Assistant Professor Cashin,
Assistant Professor Duus, Mr. Goodchild.

25. (I) Chemical Technology

An introduction to the nature and scope of the chemical industry through the study of selected chemical processes, such as common salt, sodium carbonate, sodium hydroxide, sulfuric acid, ammonia, nitric acid, methanol. The importance of economic factors and of technical factors like equilibria and reaction rates is shown.

2 class hours. Credit, 2.

Prerequisite, Chemistry 2 or 4. Mr. Cashin, Mr. Goodchild.

26. (II) Fundamentals

An introduction to the nature and scope of chemical engineering and certain fundamental concepts, to be amplified in later courses, particularly prob-

lems dealing with material and energy balances. There is a review of the chemical, mathematical, and physical principles which are particularly applicable.

2 class hours. Credit, 2.
Mr. Cashin, Mr. Goodchild.

Prerequisites: Chemistry 2 or 4; Physics 25.

55. (I) Unit Operations I

A study of the fundamental principles underlying the unit operations of fluid flow, heat transfer and evaporation. A portion of the course is devoted to a study of the thermodynamic properties of matter.

3 class hours; 2 3-hour computation periods. Credit, 5.
Mr. Cashin.

Prerequisites: Chemical Engineering, 26; Mathematics 30 or 31; Physics 25.

56. (II) Unit Operations II

A continuation of Course 55, including the additional unit operations of distillation, gas absorption, liquid extraction, crystallization, filtration, mixing, crushing and grinding.

3 class hours; 2 2-hour computation periods. Credit, 5.
Mr. Cashin.

Prerequisite, Chemical Engineering 55.

58. (II) Organic Chemical Technology

A study of some of the unit processes involved in the manufacture of organic chemicals. Unit processes studied include nitration, amination, halogenation, oxidation and esterification. Field trips will be included where possible.

3 class hours. Credit, 3.
Mr. Duus.

Prerequisite, Chemistry 51.

75. (Summer) Instrumentation

A detailed study of the underlying principles and practices in indicating, recording and controlling instruments used on industrial process equipment.

4 class hours; 2 3-hour laboratory periods per week for six weeks. Credit, 3.
Mr. Cashin.

Prerequisite: Physics 26 or 28.

77. (I) Elements of Unit Operations

For other than chemical engineering majors. An introduction to some of the unit operations of process industries. The emphasis is on the principles and types of equipment, rather than on the quantitive aspects and design.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Lindsey, Mr. Duus.

Prerequisites: Chemistry 30; Physics 25, 26.

81. (I) Heat-energy Relations

A study of the energy relations in chemical processes. Includes: types of energy, energy balances, second law, thermodynamic functions, P-V-T relations of fluids, compression and expansion on processes.

3 class hours. Credit, 3.
Mr. Duus.

Prerequisites: Chemistry 66; Chemical Engineering 56.

82. (II) Industrial Equilibria and Kinetics

A study of phase and chemical equilibria and rates of reaction in chemical processes from the industrial point of view.

3 class hours. Credit, 3.

Mr. Duus.

Prerequisites: Chemistry 66; Chemical Engineering 81.

88. (Summer) Chemical Engineering Laboratory

A quantitative study of pilot plant size equipment illustrating some unit operations. Special emphasis is placed on the securing of accurate data, correct operating techniques, and on report writing. Field trips will be made when possible.

4 8-hour laboratory days per week for six weeks. Credits, 3.

The Staff.

Prerequisite, Chemical Engineering 56.

89. (I) 90. (II) Laboratory Projects

Investigation and report on an elementary chemical engineering problem.

2 4-hour laboratory periods. Credit, 3.

The Staff.

Prerequisites, Chemical Engineering 56, 88.

91. (I) 92. (II) Seminar

Preparation and discussion of professional topics of interest to chemical engineers.

1 class hour. Credit, 1.

The Staff.

93. (I) 94. (II) Comprehensive Problems

The solution of comprehensive problems which requires the application and integration of a number of the principles studied in previous courses in chemistry and chemical engineering. Course 93 is a prerequisite for Course 94.

2 class hours; 1 3-hour computation period. Credit, 3.

Mr. Cashin.

Prerequisite: Chemical Engineering 56; Chemistry 52, 66

95. (I) Process Equipment Design

The design of process equipment for the chemical industries: riveted pressure vessels, welded pressure vessels, piping, attachments and closures, etc.

1 class hour; 1 3-hour laboratory period. Credit, 2.

Mr. Lindsey.

Prerequisites: Chemical Engineering 55; Civil Engineering 53.

98. (II) Advanced Unit Operations

A more detailed study of certain unit operations such as unsteady-state heat transfer, and multicomponent-distillation.

2 class hours. Credit, 2.

Mr. Cashin.

Prerequisite, Chemical Engineering 56.

CIVIL ENGINEERING

Professor Marston, Professor White, Professor Osgood, Professor Hendrickson, Associate Professor Marcus, Assistant Professor Feng, Assistant Professor Grow, Assistant Professor Sharp, Assistant Professor Boyer, Assistant Professor Higgins, Mr. Bartlett.

25. (I) Surveying

The theory of surveying for both measurement and layout work, description of field and office computation, notes, and drafting procedure are given in the classroom. Topics covered are use of tape, transit, level, and plane table; methods of carrying out property surveys, layout surveys, computation and field work for simple and compound horizontal and vertical curves, determination of geographic position, determination of azimuth from the sun and Polaris, and a finished map of a small area.

3 class hours; 2 3-hour laboratory periods. Credit, 5.

Prerequisite, Trigonometry. Mr. Boyer.

27. (I) and (II) Plane Surveying

The basic principles of mensuration are discussed in class. Instruction and problems involving the use of tape, transit and level are given in the field, and the preparation of a map of a small area is carried out in the drafting room. Route surveying is considered briefly. This course is not open to civil engineering students.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Prerequisite, Mathematics 5 or 7. Mr. Boyer.

28. (Summer) Property and Topographic Surveying

This course consists of a transit and tape property survey in which reference to Registry of Deeds records is required, and a topographic survey of a selected area using the plane table. Certain advanced topics such as triangulation and conformal coordinate systems are discussed as they relate to the topographic survey.

3 40-hour weeks. Credit, 3.

Prerequisite, Civil Engineering 25 or 27. Mr. Boyer.

30. (Summer) Route Surveying Practice

This practice course consists of a preliminary survey of a short highway location, and of the preparation of a set of plans including plan, profile and cross sections and earthwork quantities from the data recorded on the survey.

3 40-hour weeks. Credit, 3.

Prerequisite, Civil Engineering 25. Mr. Boyer.

34. (I) and (II) Statics

The following topics are considered: equilibrium of forces, friction, first and second movements, center of gravity. Algebraic and graphical methods are covered.

3 class hours. Credit, 3.

Mr. White, Mr. Marcus, Mr. Grow.

Prerequisites: Physics 25; Mathematics 31.

51. (I) Strength of Materials

The following topics are considered: simple stresses and strains; combined stresses; torsion; shear and bending moments in beams; stresses and deflection of beams; columns.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. White, Mr. Marcus, Mr. Grow.

Prerequisites: Civil Engineering 34; Mathematics 32.

52. (I) and (II) Dynamics

The following topics are considered: Kinematics, motion of particles, motion of rigid bodies, work and energy, power, impulse and momentum.

3 class hours. Credit, 3.

Mr. White, Mr. Marcus, Mr. Grow.

Prerequisites: Civil Engineering 34; Mathematics 32.

53. (I) and (II) Strength of Materials

A shortened version of C.E. 51 for chemical, electrical, and mechanical engineers in the industrial option.

3 class hours. Credit, 3.

Mr. White, Mr. Marcus, Mr. Grow.

Prerequisites: Civil Engineering 34; Mathematics 32.

55. (I) Transportation Engineering

A study of transportation systems with major emphasis on geometric design of highways, transportation and traffic studies, and design and operation of railroads. The laboratory periods are devoted to location and design of highways and intersections, and the design of railroad facilities.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Boyer.

Prerequisite, Civil Engineering 30.

61. (I) and (II) Testing of Materials

A study of laboratory methods for the determination of the physical properties of engineering materials and their behavior under stress.

1 class hour; 1 3-hour laboratory period. Credit, 2.

Mr. Sharp.

Prerequisite, Civil Engineering 51 or 53.

70. (II) Theory of Structures

The course treats the analysis of statically determinate structures of wood and steel, with reference to particular types of structures, such as industrial and office buildings, highway and railway bridges.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Osgood.

Prerequisite, Civil Engineering 51.

71. (I) Structural Design

This course is an application of the theory of structures to engineering practice through the preparation of designs and drawings for structural frames,

girders and trusses in steel and wood that together make up a complete building frame or bridge. Emphasis is placed upon the design of structural members and joints.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Prerequisite, Civil Engineering 70. Mr. Osgood.

72. (II) Advanced Structural Theory

The analysis of space frames and methods of finding deflections of trusses and beams are studied. Several methods of analysis of statically indeterminate structures are introduced. Application of the theories considered is made in the solution of practical problems during the laboratory periods.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Prerequisite, Civil Engineering 70. Mr. Osgood.

73. (I) Reinforced Concrete Design

This course deals with the general methods of analyzing and designing reinforced concrete structures. Application is made to slabs, beams, girders, columns, walls and foundations for buildings, retaining walls and bridges. Drawings are prepared for a reinforced concrete building.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
Prerequisite, Civil Engineering 51. Mr. Osgood.

75. (I) and (II) Fluid Mechanics

The following topics are considered: properties of fluids, gas laws, viscosity, static pressure, gages, buoyant forces, dynamics of fluids, Bernoulli's theorem, flow in pipes, orifices, nozzles, weirs and open channels, hydraulic similitude and dimensional analysis.

3 class hours. Credit, 3.
Prerequisite, Civil Engineering 52. Mr. Higgins.

76. (I) and (II) Fluid Mechanics Laboratory

1 3-hour laboratory period. Credit, 1.
Mr. Higgins.

Prerequisite, Civil Engineering 75 previously or concurrently.

77. (I) Sanitary Engineering I

This course treats the following topics: demand of water and quantity of sewage, hydrology relating to water resources and drainage, hydraulics of water supply systems and sewers, pumps and pumping stations, water collecting and distributing works and sewerage systems.

3 class hours. Credit, 3.
Prerequisite, Civil Engineering 75 or 76 concurrently. Mr. Feng.

78. (II) Sanitary Engineering II

Consideration is given to hydraulic aspects of sedimentation, flotation, aeration and recirculation, quality of water supplies, characteristics of sewage, water purification works, sewage treatment works and industrial waste problems. The laboratory periods are devoted to the practice of designing water distribution systems and sewer systems.

3 class hours; 1 3-hour laboratory period. Credit, 4.
Prerequisite, Civil Engineering 75 or 76. Mr. Feng.

79. (I) Principles of Sanitary Engineering

This course is designed for students in the Department of Public Health. It covers phases of Civil Engineering 77 and 78 with consideration of the non-engineering background of the student. Admission by permission of the instructor.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. Feng.

80. (II) Soil Mechanics

This course is a study of the mechanical classification of soil based upon field and laboratory work and the validity of these classifications as a means of predicting soil behavior. The student is guided through case studies in embankment stability, seepage and consolidation.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Prerequisite, Geology 50. Mr. Hendrickson.

81. (I) Caissons

A survey of modern theories and practice in transferring structural loads to earth masses. Pile foundations, spread footings, caissons, and buoyant systems are discussed.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Prerequisite, Civil Engineering 80. Mr. Hendrickson.

82. (II) Soil Testing

Sampling and testing of soils as to permeability, consolidation, and shear. Triaxial compression is the principal technique used.

1 class hour; 2 3-hour laboratory periods. Credit, 3.
Mr. Hendrickson.

86. (II) Sanitary Engineering Design

This is a laboratory course devoted to the design of sanitary engineering facilities, water supply and conditioning and sewerage and sewage treatment plants. Stream sanitation is considered and the latest practice and research in the sanitary engineering field are discussed.

1 class hour; 2 3-hour laboratory periods. Credit, 3.
Prerequisites: Civil Engineering 77 and 78, or concurrently. Mr. Feng.

88. (II) Advanced Stress Analysis

This course is concerned with the determination of stresses and strains in structural and machine elements.

3 class hours. Credit, 3.
Prerequisite, Civil Engineering 51. Mr. White.

90. (II) Contracts, Specifications and Estimating

A study of the essentials of contracts as applied to business procedures in the construction field, the purposes and makeup of specifications, and the processes of estimating through quantity surveys and unit cost applications.

3 class hours. Credit, 3.
Mr. Markuson.

92. (II) Professional Seminar

For seniors majoring in civil engineering. Current engineering projects are described by student reports. The professional aspect of the civil engineer's work is stressed.

3 class hours. Credit, 3.

The Department.

94. (II) Advanced Surveying

The following topics are included: Elements of astronomy, precise methods of surveying, adjustment of observations and the elements of photogrammetry.

2 class hours; 1-3-hour laboratory period. Credit, 3.

Prerequisites, Civil Engineering 25, 28. Mr. Hendrickson.

96. (II) Hydraulic Engineering

The analysis and design of hydraulic structures such as storage reservoirs, spillways, dams, levees, and shore protection and channel works are considered.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Prerequisite, Civil Engineering 76. Mr. Marston.

98. (II) Advanced Transportation Engineering

The engineering aspects of traffic problems, urban and rural highways and airports are discussed in the lecture periods. The laboratory periods are devoted to the design of various facilities including urban streets, traffic signals, intersections and an airport.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Prerequisite, Civil Engineering 55. Mr. Boyer.

ELECTRICAL ENGINEERING

Professor Roys, Professor Langford, Associate Professor Mohn†, Assistant Professor Smith, Assistant Professor Edwards, Assistant Professor Laestadius, Assistant Professor Fitzgerald, Assistant Professor Longley, Assistant Professor Lyttle, Mr. Beaubien, Mr. Jewusiak.

41. (I) Fundamentals of Electrical Engineering

Direct current circuit analysis by means of Ohm's and Kirchoff's laws, nodal equations, determinants, superposition principle, reciprocity and Thevenin's theorem. The fundamental laws of electricity and magnetism and their application to problems in electrostatics, magnetostatics and electromagnetism.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Jewusiak, Mr. Longley.

Prerequisites, Math 6, and 31 previously or concurrently.

42. (II) Alternating Current Circuits

The fundamentals of alternating current circuit theory. This includes instantaneous voltage and current relations, effective values, average power, representations of sinusoids by means of complex quantities, resonance phenomena, coupled and polyphase circuits, Fourier Series and metering in a-c circuits.

2 class hours; 1 quiz hour; 1 2-hour laboratory period. Credit, 3.

Prerequisite, Electrical Engineering 41. Mr. Jewusiak, Mr. Longley.

† On leave of absence.

53. (I) Direct Current Machinery

The theory, construction, and operation of d-c motors and generators with emphasis upon analysis of performance, design features, applications and methods of control.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Edwards.

Prerequisite, Electrical Engineering 41.

54. (II) Alternating Current Machinery

A basic study of single and polyphase a-c machinery, covering synchronous and induction motors and generators, converters, transformers and magnetic amplifiers. This includes analysis, design considerations, applications and an introductory study of transient behavior and unbalanced operation.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Edwards.

Prerequisites, Electrical Engineering 42, 53.

55. (I) Electronics

The theory and application of electron tubes and solid state devices. Basic theory consists of electron ballistics, electron emission, photoelectric effects and conduction in vacuum, gases and semi-conductors. Applications are made to the characteristics of electron tubes, varistors and transistors, together with their use for rectification, amplication and control. Amplifiers are analyzed by means of equivalent circuits and graphical methods.

2 class hours; 1 quiz hour; 2 laboratory hours. Credit, 3.

Mr. Langford, Mr. Laestadius, Mr. Beaubien.

Prerequisite, Electrical Engineering 42.

56. (II) Applied Electronics

Analysis and design of vacuum-tube and transistor circuits from the standpoints of response, distortion and stability. Applications include Class A, B and C, grounded-cathode, grounded-grid, cathode-follower and inverse feedback circuits, cascaded amplifiers, and the fundamental theory and characteristics of vacuum tube oscillators and multi-vibrators. Modulated waves, frequency conversion and detection are also considered.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Langford, Mr. Beaubien.

Prerequisite, Electrical Engineering 55.

57. (I) Engineering Analysis

Ordinary differential equations as applied to electrical and mechanical systems; vector algebra and calculus; electro-magnetic field theory through the derivation of Maxwell's field equations and the Poynting and Schelkunoff radiation vectors; reflection and refraction of plane waves; skin effect in round conductors and Bessel's functions.

3 class hours. Credit, 3.

Mr. Fitzgerald, Mr. Roys.

Prerequisites: Mathematics 32; Electrical Engineering 42.

58. (II) Electrical Transmission

A continuation of Course 57, consisting of the fundamental theory of waveguides, radiation from antennas, traveling waves in transmission systems, steady state a-c performance of long lines, and the solution of uniform recurrent network problems by means of difference calculus.

3 class hours, Credit, 3.

Mr. Fitzgerald, Mr. Roys.

Prerequisite, Electrical Engineering 57.

61. (I) 62. (II) Principles of Electrical Engineering

For mechanical, industrial and agricultural engineering students. A study of d-c and a-c circuits and machinery and basic electronics.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Lyttle, Mr. Smith.

Prerequisites; Physics 26; Mathematics 32.

63. (I) and (II) Elements of Electrical Engineering

For civil and chemical engineering students. A study of d-c and a-c circuits and machines with application to industrial problems.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Lyttle, Mr. Smith.

Prerequisites: Physics 26; Mathematics 32.

64. (II) Industrial Electricity

An elective for mechanical, industrial and chemical engineering students which deals principally with the applications of electronics to measurement and control in industry.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Lyttle, Mr. Smith.

Prerequisite, Electrical Engineering 62 or 63.

78. (II) Special Projects

A laboratory course, associated with a selected technical elective (as approved by the student's major adviser), in which the student carries out a study or project of particular interest to himself, with a minimum of supervision, and wherein he is expected to learn to do independent work. A written report is required at the conclusion of the project.

1 3-hour laboratory period. Credit, 1.

The Department.

Prerequisite, a suitable technical elective concurrently.

79. (I) Electrical Communications I

The general theory of four-terminal, and selective circuits and of the use of distributed parameter systems as circuit elements. Among the special expedients employed are matrices, duality, Foster's reactance theorem, and transmission charts. Applications are made to attenuators, filters, equalizer and delay networks, and to long lines.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Langford.

Prerequisite, Electrical Engineering 58.

80. (II) Electrical Communications II

Theory and applications of circuits for radio communication in which wideband and R-F amplifiers, oscillators, modulation, de-modulation, frequency conversion, pulse techniques, noise, interference and information theory are studied.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Langford.

Prerequisite, Electrical Engineering 56.

81. (I) Advanced Electrical Machinery

A continuation of Course 54 dealing with modern methods of machine analysis. These are developed and applied to the predetermination of the transient and short circuit behavior and stability of synchronous machines and to variable speed and single phase motors.

3 class hours; 1 3-hour laboratory period. Credit, 4.

The Staff.

Prerequisite, Electrical Engineering 54.

83. (I) Transient Analysis

A study of the transient behavior of electrical, mechanical and thermal systems. The ordinary and partial differential equations associated with the systems are set up and their solutions obtained by the classical, Heaviside operational and Fourier and Laplace transform methods. An introductory survey of functions of a complex variable leads to the evaluation of the inversion integral by means of the method of residues.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Fitzgerald, Mr. Roys.

Prerequisite, Electrical Engineering 58.

84. (II) Industrial Electronics

A study of special characteristics of the electron tubes of industry, the theory, design and operation of commercial types of circuits utilizing these tubes, including stroboscope, grid-controlled and polyphase rectifiers, inverters, welding controllers, speed and voltage regulators, high frequency heating circuits, and others.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Roys.

Prerequisite, Electrical Engineering 55.

85. (I) Electrical Measurements

Theory and practice of electric and magnetic measurements; accuracy, precision, and limitations of measurements devices.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Fitzgerald, Mr. Laestadius.

Prerequisite, Electrical Engineering 42.

86. (II) Power System Networks

This course is a study of power system networks including power transfer diagrams, voltage studies, system stability criteria, short-circuit calculations, and protective methods.

3 class hours; 1 3-hour laboratory period. Credit, 4.

The Staff.

Prerequisites, Electrical Engineering 54, 58.

87. (I) Power Applications and Control

A study of the application of electric machines and their controls. Torque relations, typical control systems, theory of relays, combinational and sequential relay systems and counting circuits are among the topics considered.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Roys.

Prerequisites, Electrical Engineering 54 and 57.

90. (II) Feedback Control Systems

The analysis and design of basic types of error-sensitive control systems and their components, including servomechanisms. Analytical and graphical methods for the determination of steady state and transient performance of the several types of controllers are developed. Applications are made to typical systems involving electrical, mechanical and hydraulic components.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Roys

Prerequisite, Electrical Engineering 83.

92. (II) Professional Seminar

Current engineering developments are discussed through student reports. The professional aspects of the electrical engineer's work is stressed. Instruction is given in the preparation of engineering papers for publication and in their presentation before technical audiences.

1 class hour. Credit, 1.

The Department.

94. (II) Microwave Engineering

A review of the fundamental principles of communications and electromagnetic fields and their application to the special problems of the generation, transmission, propagation and reception of microwaves. This also includes characteristics and specifications of standard equipment, and special training in general laboratory and commercial testing techniques.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Roys.

Prerequisite, Electrical Engineering 79.

96. (II) Principles of Electrical Design

The fundamentals of electric, dielectric, magnetic and heat-flow systems as applied to the design, rating and life of coils, transformers, machinery and other electrical equipment.

2 class hours; 1 3-hour calculation period. Credit, 3.

Mr. Roys.

Prerequisite, Electrical Engineering 54.

98. (II) Television Engineering

Application of electronics and radio engineering to the special problems of television. Among the topics considered are system theory and analysis, signal sources, video response, noise limitations, synchronization and scanning, color vision and colorimetry, principles of the NTSC system, picture pickup and display tubes, transmission and reception, and monitoring and testing procedures.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Langford.

Prerequisites, Electrical Engineering 83, and 80 previously or concurrently.

MECHANICAL ENGINEERING

Professor Weaver, Professor Bates, Professor Swenson, Professor Keyser, Associate Professor Dittfach, Associate Professor Longstaff, Associate Professor Sobala, Associate Professor Weidmann, Assistant Professor Emerson, Assistant Professor Day, Assistant Professor Costa, Assistant Professor Patterson, Assistant Professor Harrington, Assistant Professor Hopkins, Mr. Spencer.

1. (I) Engineering Drawing

The purpose of this course is to develop skill in the use of drafting equipment and to provide a working knowledge of orthographic projection. Included are such topics as lettering, multi-view drawing, sections, dimensions, working drawings and various pictorial representations. The course also includes some work in freehand sketching and ink tracing.

2 3-hour laboratory periods. Credit, 2.

Mr. Weidmann.

2. (II) Descriptive Geometry

This course covers the theory of orthographic projection more fully. It includes the representation of the geometric concepts of lines, planes and solids and the solution of engineering problems involving true sizes, angles and shapes by graphical methods.

1 class hour; 2 3-hour laboratory periods. Credit, 3.

Mr. Weidmann.

Prerequisite, Mechanical Engineering 1.

23. (Summer) Shop

The course is designed primarily for engineers other than mechanical. Approximately half the semester is spent in welding; in the other half the student gains experience in the machine shop, where he becomes familiar with the various machine and hand tools used in metal working.

3 40-hour weeks. Credit, 3.

Mr. Costa.

27. (Summer) Shop

The course covers weldability of metals, manual and automatic welding processes. Experience is gained in the manual welding of various metals.

3 40-hour weeks. Credit, 3.

Mr. Patterson.

28. (Summer) Machine Shop

A knowledge of metal-working equipment is obtained by using the fundatal machine tools such as the lathe, planer, shaper, milling machine and drill press. A reasonable amount of bench work is included. Classroom work is devoted to the theory of machine tool operation, fits, tolerances and measurement.

3 40-hour weeks. Credit, 3.

Mr. Costa.

37. (I) and (II) Basic Engineering Materials

Properties of engineering materials; failure by inelastic action, creep, fatigue, and corrosion. The crystalline nature of metals. Properties and uses of the

structural metals, wood, stone, clay products, cementing materials, plastics, and rubber.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Keyser, Mr. Harrington.

Prerequisites, Chemistry 2 or 4; Physics 27, taken previously or concurrently.

39. (II) Materials of Construction

A shortened version of Mechanical Engineering 37 for civil engineering majors.

2 class hours. Credit, 2.

Mr. Keyser.

Prerequisites, Chemistry 2 or 4; Physics 27, taken previously or concurrently.

46. (II) Fundamentals of Metallurgy

Physical metallurgy involving crystal structure, solid solutions, diffusion in the solid state, freezing of metals, hardening of metals, annealing, and equilibrium diagrams. These fundamentals are applied to a study of the iron-iron carbide diagrams, time-temperature-transformation relationships for steel, the heat treatment of steel, and heat-treating equipment. Laboratory work is intended to substantiate some of the principles developed in lecture work and to acquire basic skill in metallographic technique.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Keyser.

Prerequisites, Mechanical Engineering 39 or Chemistry 66.

61. (I) Heat Power

A one-semester terminal course for non-mechanical engineering majors, designed to present to the student the fundamental principles involved in the production of power. It consists of the basic theory underlying the field of thermo-dynamics and its application to power machinery. It includes a study of gases, vapors, thermodynamic processes, cycles and power measurement with considerable discussion, both quantitative and qualitative, of the application of the above to gasoline engines, diesel engines, gas turbines, steam turbines, and compressors.

3 class hours. Credit, 3.

The Department.

Prerequisites, Physics 28; Mathematics 6.

63. (I) Engineering Thermodynamics I

This course is a treatment of the application of the laws of heat to various energy-transforming devices. Topics include ideal and actual cycles of steam, internal combustion engines, and air compressors together with problems pertaining to these machines, energy transformations in fluid flow, variable specific heats and mixtures of gases.

4 class hours. Credit, 4.

Mr. Swenson, Mr. Longstaff.

Prerequisites, Physics 26 or 28; Mathematics 30 or 31.

64. (II) Engineering Thermodynamics II

A continuation of the work of Course 63. Study will be made of liquids and vapors, thermodynamic cycles, energy transformations and the transfer of heat, together with engineering problems pertaining to these devices.

3 class hours. Credit, 3.

Mr. Swenson, Mr. Longstaff.

Prerequisite, Mechanical Engineering 63.

65. (I) Heat Engineering I

This course is a survey of the field of applied energy and is designed for engineering students outside of the mechanical engineering field. The application of the laws of heat to energy transforming devices is studied, but not as extensively as in Courses 63 and 64. A study will be made of gases, vapors, fuels, combustion, heat transfer, measurement of power, and internal combustion engines.

3 class hours. Credit, 3.

Prerequisites, Physics 28; Mathematics 6. THE DEPARTMENT.

66. (II) Heat Engineering II

A continuation of the work of Course 65. Air compressors, fans, refrigeration, and air conditioning turbines, jet propulsion and power plants will be studied.

3 class hours. Credit, 3.

Prerequisite, Mechanical Engineering 65. THE DEPARTMENT.

67. (II) Mechanical Instrumentation Laboratory

The calibration and application of instruments used in the testing of mechanical engineering apparatus.

1 3-hour laboratory period. Credit, 1.

Prerequisite, Mechanical Engineering 63 concurrently. THE DEPARTMENT.

68. (II) Kinematics

Principles of mechanism, including velocity and acceleration diagrams, instant centers, gear teeth and gear trains, eams, and various speed transmissions.

2 class hours; 1 3-hour laboratory period. Credit, 3.

MR. BATES, MR. SOBALA.

Prerequisites. Mechanical Engineering 1; Civil Engineering 52.

74. (I) and (II) Basic Aerodynamics

An introduction to the basic concepts of applied aerodynamics, for the student who has no previous background in the subject. Topics include properties of air, ideal fluid flow, airfoils and their properties, aircraft performance and stability.

3 class hours. Credit, 3.

Prerequisite, Civil Engineering 76. MR. SOBALA.

75. (I) Steam Power Plants

This course is a study of the steam power plant, including boilers, stokers, fuels, combustion, steam generation, prime movers, and auxiliary equipment, and engineering problems involved in design and operation.

3 class hours. **Credit, 3.**

Prerequisite, Mechanical Engineering 64. MR. SWENSON.

76. (II) Refrigeration and Air Conditioning

The course content includes a study of the fundamental principles of thermodynamics as applied to refrigeration and air control. Application of refrigeration to industrial processes and the control of temperature, humidity and motion of air in buildings will be studied.

3 class hours. Credit, 3.

Prerequisite, Mechanical Engineering 64. MR. SWENSON.

77. (I) Internal Combustion Engines

A study is made of spark-ignition and compression-ignition engines including design, fuels, carburetion, ignition, combustion, lubrication, cooling, and engine performance. The gas turbine and jet propulsion will be included.

3 class hours. Credit, 3.

Mr. Dittfach.

Prerequisite, Mechanical Engineering 64.

79. (I) Mechanical Engineering Laboratory I

Tests of fuels and lubricants. Performance tests of steam engines and turbines, gasoline and Diesel engines, fans, hydraulic apparatus, refrigeration systems and other typical engineering equipment. Emphasis on laboratory procedure and orderly presentation of results.

1 3-hour laboratory period. Credit, 1.

The Department.

Prerequisites, Civil Engineering 75 or 76 concurrently; Mechanical Engineering 64 or 66; Mechanical Engineering 67 for Mechanical Engineering majors.

80. (II) Mechanical Engineering Laboratory II

This course continues the work of the first semester in more advanced phases.

2 3-hour laboratory periods. Credit, 2.

The Department.

Prerequisite, Mechanical Engineering 79.

81. (I) Experimental Mechanical Engineering

For non-mechanical engineering majors. Calibration and application of instruments used in the testing of mechanical engineering apparatus. Performance tests on mechanical engineering equipment such as internal combustion engines, steam power apparatus, refrigeration machines, and fans and blowers.

2 3-hour laboratory periods. Credit, 2.

The Department.

Prerequisites, Mechanical Engineering 66; Civil Engineering 75 concurrently.

82. (II) Heat Transfer

Methods of evaluating heat transfer rates and predicting operating temperatures. Heat transfer by conduction, radiation, and convection. Topics include one and two-dimensional conduction, heat flow, transient heat flow, fins, numerical and graphical solutions, free and forced convection and radiation.

3 class hours. Credit, 3.

Mr. Day.

Prerequisites, Mechanical Engineering 64; Mathematics 32 or 92.

83. (I) Machine Design

Principles involved in the design of various machine parts including fastenings, shafts, belts, bearings, gears, and pressure vessels.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Bates.

Prerequisites, Civil Engineering 51 or 53; Mechanical Engineering 2, 68.

84. (II) Basic Engineering Analysis

The application of mathematical methods to the solution of mechanical engineering problems in such fields as vibrations, elasticity, fluid mechanics, and

dynamics. The analysis of the problems and the derivation of the governing equations will receive particular emphasis.

3 class hours. Credit, 3.

Mr. Sobala, Mr. Day.

Prerequisites, Mathematics 32 or 92.

85. (I) Dynamics of Machinery

Elements of vibration theory, vibration isolation, absorbers, instrumentation, analysis of equivalent masses and shaft systems. Dynamic balancing.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Sobala.

Prerequisites, Civil Engineering 52; Mechanical Engineering 68.

86. (II) Advanced Machine Design

A continuation of Course 83. Additional elementary parts are studied which combine into the design of complete machines in the latter part of the course.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Bates.

Prerequisite, Mechanical Engineering 83.

87. (I) Engineering Thermodynamics III

Topics investigated include steam turbines, steam power plants, refrigeration, high-velocity flow, and shock phenomena.

3 class hours. Credit, 3.

The Department.

Prerequisite, Mechanical Engineering 64.

88. (II) Steady Flow Machinery

The principles of thermodynamics are applied to steam and internal combustion turbines, condensers, and other heat transfer apparatus.

3 class hours. Credit, 3.

Mr. Swenson.

Prerequisites, Mechanical Engineering 64 or 66; Civil Engineering 76.

90. (II) Advanced Metallurgy

Advanced topics in engineering metallurgy, such as the effects of alloying elements in steel, aluminum, magnesium, and copper alloys. The significant properties of, the fabricating methods for, and the applications of ferrous and nonferrous metals. Admission by permission of instructor.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Keyser.

Prerequisite, Mechanical Engineering 46.

91. (I) Professional Seminar

For senior and graduate students only. Presentation of papers on various important subjects in the field of mechanical engineering with principle emphasis on recent developments.

Credit, 1.

The Department.

94. (I) or (II) Experimental Mechanical Engineering

Special work in mechanical engineering for a senior thesis. Admission by permission of instructor.

Credit, 1-3.

The Department.

INDUSTRIAL ENGINEERING

25. (I) Manufacturing Processes

The methods of producing and fabricating the basic engineering materials: metals, cementing materials, ceramics, plastics, rubber, and lumber. Production methods (excluding machining) of metal parts and their assembly in a typical mass production industry is discussed. Laboratory periods involve inspection trips and movies.

1 class hour; 1 3-hour laboratory period. Credit, 2.

Mr. Keyser.

26. (Summer) Tool Engineering

This course includes the determination of the manufacturing operations necessary to produce a finished product. This is followed by consideration of the principles embodied in the design of jigs, fixtures, dies, and gauges necessary to perform each operation. The economics of tooling as influenced by intermittent or continuous type manufacturing and the effect of volume are also included.

3 44-hour weeks. Credit, 3.

Mr. Costa.

51. (I) Industrial Management

A course designed to acquaint the student with the principles of industrial engineering and their application to the solution of the problem of industrial plant operation.

3 class hours. Credit, 3.

Mr. Weaver.

54. (II) Engineering Economy

This course includes a study of the bases for comparison of alternatives in engineering projects, break-even and minimum cost points, evaluation of proposals for new activities, economy of operations, the evaluation of public activities, the output and life of typical items of engineering and industrial equipment, manufacturing lot sizes, economic purchase quantities, the selection and replacement of structures and machines.

3 class hours. Credit, 3.

Mr. Emerson.

Prerequisites, Economics 25; Mathematics 6 or 29.

75. (I) Job Evaluation

A study of the principles used to determine an evaluation of all occupations in order to establish an equitable rating between them, to establish sound wage and salary policies.

2 class hours. Credit, 2.

Mr. Weaver.

Prerequisite, Industrial Engineering 51.

76. (I) Time Study

A study of the principles involved in the establishment of production standards and their application in the management functions of cost accounting, estimating, production control, incentives, budgetary control. Development of standard data.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Emerson.

Prerequisite, Industrial Engineering 82.

77. (I) Production Control

A study of the principles used to regulate production activities in keeping with the manufacturing plan.

3 class hours. Credit, 3.

Mr. Emerson.

Prerequisite, Industrial Engineering 51.

78. (II) Factory Planning and Layout

A study of the principles applying to the determination and development of the physical relationship between plant, equipment and operators working toward the highest degree of economy and effectiveness in operation.

1 class hour; 1 3-hour laboratory period. Credit, 2.

Mr. Weaver.

Prerequisites, Mechanical Engineering 2; Industrial Engineering 51.

80. (II) Plant Budgetary Control

A study of the principles used to pre-determine expenses for the factors of production and the comparison of results with the estimates to determine and deal with the causes of expense variations as applied by the operating organization in the industrial plant.

3 class hours. Credit, 3.

Mr. Weaver.

Prerequisite, Industrial Engineering 51.

82. (II) Work Simplification

A study of the principles involved in the simplification of means of doing work and in the application and use of these principles.

1 class hour; 1 3-hour laboratory period. Credit, 2.

Mr. Weaver.

Prerequisite, Mechanical Engineering 68.

86. (II) Industrial Management

Designed for students other than industrial engineers. A broad course dealing with the many problems encountered in a modern industry. Topics include types of organization, management, plant location, arrangement of equipment, product design, methods of production control, costs, wage payment systems and personnel relations.

3 class hours. Credit, 3.

Mr. Emerson.

88. (II) Motion and Time Study

This course covers the combined fields of motion study and time study for junior and senior students outside the industrial engineering field.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Emerson.

92. (I) Professional Seminar

For seniors and graduate students.

Credit, 1.

The Department.

ENGLISH

Professor Goldberg, Professor Rand, Professor Helming, Professor O'Donnell, Professor Varley, Associate Professor Allen, Associate Professor Lane, Assistant Professor Horrigan, Assistant Professor Williams, Assistant Professor Koehler, Assistant Professor Kaplan, Assistant Professor Barron, Assistant Professor Mitchell, Assistant Professor Rudin, Mrs. Wright, Mrs. Hogan, Mrs. DuBois, Mr. Clark†, Mr. Madeira, Mr. Tucker, Mr. Haven†, Mr. Savage, Mr. Collins, Mrs. Smith, Mrs. O'Donnell, Mr. Page, Mrs. Barron. Visiting Professor Holt.

COMPOSITION

1. (I) 2. (II) English Composition

The purpose of the course is to teach effective exposition for use in college and professional work. College-level readings will be used to attain this end and to acquaint the student (1) with the commoner critical terms and literary forms and (2) with the skills necessary to the comprehension of mature writing.

2 class hours. Credit, 2.

The Department.

81. (I) 82. (II) Creative Writing

A course in critical and imaginative composition based upon the examples of standard authors and the experience of the student. It provides an opportunity for work in description, narrative, verse, and drama, as well as in exposition. The chief emphasis first semester is on fiction and poetry; second semester, on non-fiction. English 82 is a continuation of 81 but may be elected independently.

3 class hours. Credit, 3.

The Department.

Prerequisite, a mark of A or B in English 2 (U. of M.) or permission of the instructor.

83. (I) (II) Technical Writing

For majors in engineering. A course in factual and inductive exposition with special emphasis upon process reports and theses.

2 class hours. Credit, 2.

Mr. Mitchell.

Prerequisites, English 1, 2.

84. (II) Technical Writing

For students not majoring in engineering. A course in factual and inductive exposition with special emphasis upon library research and the preparation of reports, and theses.

3 class hours. Credit, 3.

Mr. Mitchell.

Prerequisites, English 1, 2.

† On leave of absence.

LITERATURE

25. (I) 26. (II) Humane Letters

A general reading course based upon a chronological selection of masterpieces: classical, continental, and English.

3 class hours. Credit, 3.

THE DEPARTMENT.

50. (II) Chaucer

A study of Chaucer's development and preeminence as a creative artist and an attempt to appreciate his humanism.

3 class hours. Credit, 3.

MR. HELMING.

51. (I) The Renaissance in England

A study of various aspects of the Renaissance as revealed in such writers as Spenser, Bacon, Sir Thomas Browne, Burton, and Hobbes. Special emphasis is given to Spenser's *Faerie Queene.*

3 class hours. Credit, 3.

MR. LANE.

53. (I) Lyrical Poetry of the Renaissance in England (1957-58)

A study of lyrical poets such as Sidney, Campion, Jonson, Herrick, Lovelace, Suckling, Carew, Donne, Herbert, Vaughan, Crashaw, Traherne and Marvell. Emphasis is given to the "Metaphysical" tradition. Given in alternate years.

3 class hours. Credit, 3.

MR. GOLDBERG, MR. BARRON.

54. (II) Milton

The development of the mind and art of Milton as Renaissance writer. Emphasis is placed on *Paradise Lost, Paradise Regained,* and *Samson Agonistes.*

3 class hours. Credit, 3.

MR. GOLDBERG, MR. HELMING, MR. KOEHLER.

55. (I) Shakespeare

This course is based upon the reading of about twenty-five of Shakespeare's plays, and attempts both to indicate the evolution of the dramatist and to emphasize the various phases of his art.

3 class hours. Credit, 3.

MR. RAND.

57. (I) English Literature of the Restoration

A study of the social problems and literary values of the Restoration period as they appear in prose, verse, and drama. Emphasis will be placed on the satire of Dryden; and on the development of the theatre from the Restoration through Congreve and the Comedy of Manners.

3 class hours. Credit, 3.

MR. KOEHLER.

58. (II) Elizabethan Dramatists

A study of English drama from the death of Elizabeth to the closing of the theaters. Special consideration will be given to the plays of Jonson, Beaumont, Fletcher, Webster, Middleton, Massinger, and Shirley.

3 class hours. Credit, 3.

MR. O'DONNELL.

59. (I) English Literature of the Eighteenth Century

A study of the literature of the Augustan Age, with special emphasis on the writing of Swift and Pope.

3 class hours. Credit, 3.

Mr. Barron.

60. (II) English Literature of the Eighteenth Century

A continuation of English 59, but may be elected independently. A study of the literature of the later Eighteenth Century with special emphasis on the Johnson Circle.

3 class hours. Credit, 3.

Mr. Barron.

61. (I) Romantic Poetry (1958-59)

A study of the Lake Poets (primarily Wordsworth and Coleridge) and their precursors. Given in alternate years.

3 class hours. Credit, 3.

Mr. Rand.

62. (II) Romantic Poetry (1956-57)

A continuation of English 61 but may be elected independently. A study of Byron, Shelley and Keats. Given in alternate years.

3 class hours. Credit, 3.

Miss Horrigan.

63. (I) American Poetry

A study of American poetry from Colonial times to 1900, with special emphasis upon the work of Freneau, Bryant, Emerson, Longfellow, Whittier, Poe, Whitman, and Emily Dickinson.

3 class hours. Credit, 3.

Mr. O'Donnell, Mr. Williams.

65. (I) English Prose of the Nineteenth Century

A study of the chief Romantic prose writers in relation to literary techniques and main currents of epochal thought and feeling. Among the authors treated are Coleridge, Lamb, Hazlitt, DeQuincey, Landor, Carlyle, and Ruskin.

3 class hours. Credit, 3.

Mr. Goldberg.

66. (II) English Prose of the Nineteenth Century

A continuation of English 65, but may be elected independently. A study of the chief Victorian prose writers in relation to literary techniques and main currents of epochal thought and feeling. Among the authors treated are Macaulay, Newman, Arnold, Mill, Huxley, Pater, and Stevenson.

3 class hours. Credit, 3.

Mr. Goldberg.

68. (II) Modern Drama

This course traces the development of continental English and American drama from the time of Ibsen to the present day. Its purpose is to impart an intelligent and enthusiastic interest in the drama of the twentieth century.

3 class hours. Credit, 3.

Mr. Rand, Mr. Williams.

69. (I) Victorian Poetry (1957-58)

A study of Tennyson and Browning. Given in alternate years.

3 class hours. Credit, 3.

Mr. Rand.

71. (I) Biography (1957-58)

The history of the biography as a literary type; discussion of leading biographers from Boswell to Maurois, with special emphasis upon the development of the modern biographical method. Given in alternate years.

3 class hours. Credit, 3.

Mr. Helming.

72. (II) The Bible as Literature

A study of the King James version of the Bible, with emphasis upon the Hebrew as discernible in translation, the poetic qualities characteristic of Tudor England, and the varied influence of the Bible upon subsequent English poetry.

3 class hours. Credit, 3.

Mr. Rand.

73. (I) The Novel from Defoe through the Victorians

The development of the novel; the reading and discussion of eight or nine great English novels of the eighteenth and nineteenth centuries.

3 class hours. Credit, 3.

Mr. Allen, Mr. Helming.

74. (II) Greek Classics in Translation

Readings and discussion of the epics of Homer, representative dramas of Aeschylus, Sophocles, Euripides, and Aristophanes, the "Socratic" dialogues of Plato, and Thucydides' history of the Peloponnesian War. Intended to acquaint students with the famous myths and stories of classical antiquity, and the literary forms and ideas which have contributed most to subsequent literatures.

3 class hours. Credit, 3.

Mr. Helming, Mr. Kaplan.

76. (II) Modern Poetry

This course attempts to trace the spirit of twentieth century poetry from such authors as Hardy, Whitman, and Emily Dickinson to those of the present day.

3 class hours. Credit, 3.

Mr. Rand, Miss Horrigan.

77. (I) The Modern Novel

An analytical presentation of eleven or twelve novels written between 1890 and 1920, in which the expanding form and the extension of critical themes will be stressed.

3 class hours. Credit, 3.

Mr. Varley.

78. (II) The Contemporary Novel

A continuation of English 77, covering about twelve novels written between 1920 and 1950, with some consideration of social issues reflected in the fiction. English majors will not elect both English 77 and 78.

3 class hours. Credit, 3.

Mr. Varley.

79. (I) Literary Criticism (1957-58)

A study of major critical attitudes and principles, in relation to practice and philosophic background. Emphasis is placed upon important critics and theorists from Plato and Aristotle through those of the eighteenth century. Given in alternate years.

3 class hours. Credit, 3.

Mr. Goldberg.

80. (II) Literary Criticism (1957-58)

A continuation of English 79, but may be elected independently. Emphasis is placed upon important critics and theorists of the nineteenth and twentieth centuries. Given in alternate years.

3 class hours. Credit, 3.

Mr. Goldberg.

85. (I) Major American Writers

A study of a selected group of the major American writers of the nineteenth and early twentieth centuries, including Emerson, Hawthorne, Longfellow, Lowell, Henry James, Henry Adams, Fitzgerald, and Hemingway. A careful analysis will be made of the varying literary forms given to such dominant themes as nature and the conflict between the individual and society.

3 class hours. Credit, 3.

Mr. O'Donnell.

86. (II) Major American Writers

A study of a selected group of the major American writers of the nineteenth and early twentieth centuries, including Cooper, Poe, Melville, Thoreau, Whitman, Mark Twain, Stephen Crane, Sinclair Lewis, and Faulkner. A careful analysis will be made of the varying literary forms given to such dominant themes as nature and the conflict between the individual and society.

3 class hours. Credit, 3.

Mr. Kaplan.

87. (I) Problems in American Literary and Linguistic Studies

An exploration of problems connected with the study of American language and literature in the context of American culture and cultural interrelationships.

Credit, 1-3.

Mr. Goldberg and Visiting Lecturer.

88. (II) Problems in Language and Literature

Intended for English majors but open to others by permission and in accordance with the nature of the current offering. An exploration of developments in literary and linguistic methodology and theory, and in the study of language and literature. Readings will be drawn largely from important English writers, but relevant material from other languages and literature will be used.

Credit, 1-3.

Mr. Goldberg and Visiting Lecturer.

ENTOMOLOGY

Professor Alexander, Professor Sweetman, Associate Professor Shaw, Associate Professor Hanson, Assistant Professor Smith, Mr. Field*, Mr. Weidhaas.

26. (II) General and Field Entomology

The lectures are devoted to a brief survey of the entire field of entomology; structure and metamorphosis; the more important methods and materials for control of injurious species; a survey of the more conspicuous and important insects with particular attention to the fauna of New England. A laboratory period will be devoted to the preparation and formation of a collection of insects. Until about April 10th, this work will be done indoors and will consist of lectures and practical work preparatory to the field work after that date. Collections made by the students are studied in later courses.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-8:50 or 10:00-10:50 M. F.; 1:00-2:50 M. Tu. W. Th. F.
Mr. Alexander, Miss Smith.

51. (I) Pests of Special Crops

For students not specializing in entomology who desire a more complete knowledge of the insects connected with their major lines of work. Work in the laboratory consists of identification, life-history studies and control measures of important insect pests. Work of this nature is available on pests of field crops, market-garden crops, fruits, flowers, shade trees and shrubs, forest trees, household articles, domestic animals, and man.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
10:00-10:50 M.; 1:00-2:50 Tu.; 2:30-3:50 Th. Mr. Weidhaas.
Prerequisite, Entomology 26.

53. (I) Applied Entomology

Studies on the more important insect pests, their life-histories, damage, identification, and methods of control. Special attention is devoted to the use of entomological literature, methods of preparing scientific papers, and the general principles of insect control.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
10:00-10:50 W.; 3:00-4:50 M. F. Mr. Shaw.
Prerequisite, Entomology 26.

55. (I) 56. (II) Classification of Insects

Laboratory work on the identification of the major orders of insects. In Course 56, the immature stages of insects, with particular stress on their structures and recognition.

3 2-hour laboratory periods. Credit, 3.
8:00-9:50 Tu. Th. S. Mr. Alexander, Miss Smith.
Prerequisites, Entomology 26; Entomology 57, previously or concurrently.

57. (I) Insect Morphology

The lectures treat of the external and internal anatomy, particularly of the major orders, stress being placed upon the phylogenetic relationships, as

* On leave of absence for military service.

backgrounds for parallel and subsequent work in taxonomy and physiology of insects.

1 class hour; 3 2-hour laboratory periods. Credit, 4.
10:00-10:50 F.; 1:00-2:50 M. Tu. Th. Mr. Hanson.
Prerequisite, Entomology 26.

60. (II) Structural Pest Control

For students specializing in entomology, especially those desiring to enter the structural pest field, and others interested in gaining knowledge of methods of combating insect and rodent pests. The emphasis will be placed on the control of those pests attacking buildings and other structures, foods, fabrics, and other stored products in private homes or other establishments. The life history, feeding habits, methods of reproduction, and dispersal of the various species will be stressed in so far as these influence control measures.

2 class hours. Credit, 2.
11:00-11:50 M. F. Mr. Sweetman.
Prerequisite, Zoology 1; Entomology 26 desirable.

72. (II) Forest and Shade Tree Insects

The lecture work deals with the principles and methods of controlling insects which attack shade trees, forests and forest products. The laboratory periods are devoted to a study of the more important species, their identification, biology, and specific control measures.

1 class hour: 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 W.; 1:00-2:50 M. F. Mr. Hanson, Mr. Weidhaas.
Prerequisite, Entomology 26; 53, 55, 56, and 57 desirable.

74. (II) Medical and Veterinary Entomology

The relationships of insects and their allies to the health of man and animals. The classification, biology and control of these pests is studied in detail.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
10:00-10:50 W.; 3:00-4:50 Tu. Th. Mr. Shaw.
Prerequisite, Entomology 26.

79. (I) Animal Ecology

Designed for students specializing in entomology, zoology, and related fields. The course deals with the relation of animals to their environment, covering the physical factors as temperature, moisture, light, etc., and biotic factors as neighbors, competitors, predators, etc. Both terrestrial and aquatic communities are studied. The student is shown not only that animals do things, but why they make definite responses to the environmental factors. Actual measurements of the environmental factors and responses of the animals in the field and laboratory are included.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 M. F.; 3:00-4:50 M. Mr. Sweetman.
Prerequisite, Entomology 26 or Zoology 1 or equivalent.

80. (II) Insect Control

The scientific basis of insect control is considered from the chemical, biological, ecological, mechanical, and legislative approaches. Special emphasis is placed on the composition, manufacture, preparation, and reaction of insecti-

cides, and the use of resistant hosts, micro-organisms and the larger parasites and predators that might be used in the control of insects.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 M.; 3:00-4:50 M. F. Mr. Sweetman.
Prerequisites, Entomology 53, 55, and 57; 79 and 81 desirable.

81. (I) Physiological Entomology

A detailed consideration is given to the organ systems, showing the functions such as nutrition, respiration, and growth, and the relationship of physiology to behavior. A portion of the laboratory time will be devoted to assigned individual problems dealing wth any phase of insect biology or control and conducted on a research basis.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
9:00-9:50 Th.; 3:00-4:50 W. F. Mr. Sweetman.
Prerequisite, Entomology 26; 55, 56, and 57 desirable.

87. (I) 88. (II) Special Problems in Entomology

Problem work in many fields, as apiculture, biological control and insectary practice, insecticides, morphology, and classification. Intended primarily to introduce qualified students to research methods in some branch of entomology. Excess graduation credits are necessary for election.

Hours by arrangement. Credit, 1, 2, or 3.
The Department.
Prerequisites, Entomology 26, 53, 55, 57, and should be preceded or accompanied by any other courses in the restricted field of the problem.

89. (I) Entomological Techniques

Theory and practice in the preservation, preparation, and mounting of insects for study and display. Excess graduation credits are necessary for election.

2 2-hour laboratory periods. Credit, 2.
Hours by arrangement. Miss Smith.
Prerequisites, Entomology 26 and permission of instructor.

90. (II) Evolution

The phylogeny of plants and animals is outlined at some length in conjunction with consideration of factors and forces influencing and guiding evolution. Especial consideration is given throughout the course to the implications and applications of evolutionary concept to human behavior, welfare and philosophy.

2 class hours. Credit, 2.
10:00-10:50 M. F. Mr. Hanson.

APICULTURE

66. (II) Introductory Beekeeping

This course is designed to give the student a broad grasp of the general field of apiculture. The lectures cover honeybees and their relatives, biology of the bee, methods of management, diseases, pollination, queen rearing, honey

produciton, and history of beekeeping. The laboratory will acquaint the student with the structure of the bee, equipment for keeping bees and its construction, costs of beekeeping, plants of value for bees, and as much as possible the actual management of bees in the apiary.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 M. F.; 1:00-2:50 M. Mr. Shaw.

85. (I) Advanced Beekeeping

This course is designed for the student who wants more detailed knowledge of the management of bees. It will cover such topics as fall management, wintering, the care of the honey crop, grading and packaging of honey, judging honey, bee diseases, beeswax, and some simple biometrical problems relating to bees. If possible, one or more visits to commercial apiaries will be made.

1 class hour; 1 2-hour laboratory period. Credit, 2.
Mr. Shaw.

Prerequisite, Entomology 66.

FLORICULTURE

Professor Thayer, Assistant Professor Ross,
Assistant Professor Jester, Mr. Goddard.

26. (II) Garden Materials

A study of the annuals, biennials, herbaceous perennials, bulbs, bedding plants, and roses that are valuable for use in floricultural or landscape gardening work. Methods of propagation, culture, and uses of the various plants are considered as well as identification of materials.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 M. F.; 3:00-4:50 Th. Mr. Goddard.

51. (II) Greenhouse Management

This course is intended to familiarize students with the methods and principles involved in the management of greenhouses and greenhouse crops; history and development of the floricultural industry, preparation of soils, fertilizers, potting, watering, ventilation, control of insects and diseases, methods of plant propagation, forcing plants, soilless methods of plant culture. At some time during the semester the members of the class will be required to take a one-day trip to visit large commercial establishments at an approximate cost of five dollars.

2 class hours; 1 2-hour laboratory period. Credit, 3
9:00-9:50 M. F.; 1:00-2:50 F. Mr. Jester.

52. (II) Floral Arrangement

A study of the principles involving the arrangement and use of cut flowers and plants; funeral designs, basket and vase arrangements, corsages, wedding bouquets, table decorations, home, church, and other interior decorations. A study of color and color harmony as applied to such work. This course is

limited to ten students, preference being given to students specializing in floriculture and landscape architecture.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
8:00-8:50 Th.; 1:00-2:50 M. F. Mr. Jester, Mr. Ross.

54. (II) Greenhouse Construction and Heating

The location, types, arrangements, construction, cost, equipment, heating, and ventilation of greenhouse structures; the drawings of plans and study of specifications. Special emphasis laid on heating problems.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 M. F.; 3:00-4:50 M. Mr. Thayer, Mr. Goddard.

58. (II) Amateur Floriculture

This course is intended primarily for major students in the School of Home Economics and for other women students. Three phases of floriculture will be considered: (1) the arrangement and use of cut flowers for decorative purposes in the home and elsewhere, (2) house plants, methods of propagation, (3) garden flowers and their uses on the home grounds.

2 class hours; 1 2-hour laboratory period. Credit, 3.
10:00-10:50 Tu. Th.; 3:00-4:50 Tu. or 1:00-2:50 Th.
Mr. Thayer, Mr. Ross, Mr. Goddard.

75. (I) 76. (II) Commercial Floriculture

A detailed study of the cultural methods for the important commercial cut-flower crops and potted plants. The marketing of flowers and plants, including the management of wholesale markets and retail stores, a study of systems of record keeping, cost analysis, inventory methods, and other phases of this important part of the floricultural industry. Trips may be taken to nearby commercial establishments.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu., Th.; 1:00-2:50 Tu. Mr. Jester.
Prerequisite, Floriculture 51.

79. (I) Conservatory Plants (1956-57)

Alternates with Course 81 for students specializing in floriculture. A study of the foliage and flowering plants used in conservatory work; methods of propagation; identification of materials.

1 class hour; 1 2-hour laboratory period. Credit, 2.
12:00-12:50 Th.; 1:00-2:50 M. Mr. Thayer, Mr. Ross.

81. (I) Herbaceous Gardens and Borders

Alternates with Course 79 for students specializing in floriculture; given annually for students specializing in landscape architecture. This course is a continuation of Course 26 with emphasis on the use of herbaceous materials in various types of planting of borders and gardens.

1 class hour; 1 4-hour laboratory period. Credit, 3.
10:00-10:50 Tu.; 1:00-4:50 Th. Mr. Thayer.
Prerequisite, Floriculture 26.

82. (II) Seminar and Special Problems

For seniors specializing in floriculture. Presentation and discussion of research work in floriculture and other related fields and individual problems.

1 class hour; 4 laboratory hours. Credit, 3.
11:00-11:50 W.; laboratory hours by arrangement. The Department.

FOOD TECHNOLOGY

Professor Fellers, Professor Levine, Associate Professor Fagerson, Assistant Professor Baker, Assistant Professor Livingston, Assistant Professor Cournoyer, Mr. Lampi, Mr. Jackson, Mr. Khatchikian.

51. (I) Introductory Course

This is a general elementary course, primarily for food technology majors, covering food economics, production, distribution and processing. The applications of fundamental science to the food industries are pointed out. The laboratory exercises cover both the theory and practice of canning, freezing and dehydration. The principles of packaging are considered. Fruit and vegetable products are prepared and graded.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-8:50 Tu., Th.; 1:00-2:50 Th. or Fr. Mr. Fellers.

52. (II) Food Products and Adjuncts

This is a continuation of Course 51. The laboratory work includes pickles and pickle products, maple products, citrus products, fruit syrups, soups, condiments, and the preservation of meat, fish, poultry, and vegetables. The properties and uses of sugars, syrups, brines, enzymes, acids, salt, pectin, preservatives and antioxidants are considered. Experience is given in the use and handling of instruments and equipment.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-8:50 Tu., Th.; 1:00-2:50 W. or Th. Mr. Fellers.
Prerequisite, Food Technology 51.

61. (I) Industrial Technology

A survey of commercial practices in the manufacture and preservation of food products. This will involve a study of equipment, factory arrangement, sanitation, government regulations, and the operation of types of commercial equipment in quantity production.

1 class hour; 1 4-hour laboratory period. Credit, 3.
10:00-10:50 Th.; 1:00-4:50 M. or Tu. Mr. Levine.
Prerequisites: Food Technology 52; Bacteriology 31.

62. (II) Industrial Technology

This is a continuation of Course 61. The class exercises will deal largely with a survey study of the sources of raw material, commercial methods of manufacture, packing and distribution of the more common foods. The important contributions of research to food technology will be studied. Laboratory work will include the formation of research projects, interpretation of research data, the use of preservatives, the simple analysis of foods and the commercial practices as applied to preservation of such materials as are available: fish, meats, poultry, and spring vegetables. The inspection and grading of canned food will be studied. Various plant visits including a two-day field trip to food plants in the Boston area will be taken. The trip will cost the student about fifteen dollars.

1 class hour; 1 4-hour laboratory period. Credit, 3.
10:00-10:50 Th.; 1:00-4:50 M. or Tu. Mr. Levine.
Prerequisite, Food Technology 61.

71. (I) 72. (II) Food Science Literature

For seniors who specialize in food technology.

2 class hours. Credit, 2.
11:00-11:50 M. W. The Department.

75. (I) and (II) Food Preservation

For students not majoring in food technology. A survey is made of the causes of food spoilage and of the methods commonly used in preserving foods. The important food products are discussed with emphasis on raw materials used, processing methods and examination of packaged foods. Methods of detecting and preventing spoilage are studied. The laboratory exercises cover the preservation of the major food groups. The theory and use of the pressure cooker are included.

2 class hours; 1 2-hour laboratory period. Credit, 3.
12:00-12:50 Tu. Th.; 3:00-4:50 M. or Th. Mr. Lampi.

82. (II) Confections and Cereal Products

The materials offered in this course are as follows: the home manufacture of fruit preserves, candied and glacéed fruits, pastes, confections, candies, and other specialties. Approximately one-half the semester is devoted to elementary work in candy making. This course will also consider the principles of baking, doughs, various cereal products and dry mixes.

2 2-hour laboratory periods. Credit, 2.
3:00-4:50 W. F. Mr. Levine.

85. (I) 86. (II) Marine Products Technology

A survey of marine products of commerce and industry. Canning, curing, and freezing of seafoods. Chemical and micro-biological aspects of the industry. By-products, industrial problems and scientific literature. Emphasis is placed on the New England fisheries. The lectures may be taken without the laboratory hours.

2 class hours; 1 2-hour laboratory period. Credit, 3 or 2.
Mr. Fellers.

91. (I) Analysis of Food Products

Laboratory studies on the grading of foods, examination of foods for adulteration, testing accessory products for quality, and determining the causes of spoilage or deterioration in processed food products. Physical, chemical, microbiological, and microscopical methods will be employed. Training in the use of the A.O.A.C. Standard Methods. Enrollment limited to 18.

1 class hour; 1 4-hour laboratory period. Credit, 3.
9:00-9:50 Th.; 1:00-4:50 Th. or F. Mr. Livingston.
Prerequisites: Food Technology 52; Bacteriology 31; Chemistry 30.

92. (II) Objective Analytical Methods and Instrumentation

For students specializing in food technology. This is a continuation of Course 91. It includes interpretation of analysis, sanitation and food laws, government grading of processed foods, use of manuals and the technical work of trade associations. Laboratory work includes use of all kinds of laboratory and field equipment and apparatus used in food plants.

1 class hour; 1 4-hour laboratory period. Credit, 3.
9:00-9:50 Th.; 1:00-4:50 Tu., W., or Th. Mr. Livingston.
Prerequisite, Food Technology 91.

96. (II) Introductory Research Methods

For food technology majors. The application of the fundamental sciences to food technology research.

Hours by arrangement. Credit, 2.
THE DEPARTMENT.

98. (II) Sensory Evaluation Methods

An introduction to sensory measurements in the evaluation and acceptance of foods. Panel tests and their statistical interpretation; taste, odor, color, and texture measurements; application to food quality control and grading. For seniors only.

1 class hour; 1 2-hour laboratory period. Credit, 2.
MR. FAGERSON.

FOOD MANAGEMENT

33. (I) Introductory Food Management

An overall study of food service as represented by restaurants, institutions, hotels, and clubs, including the Armed Services. Principles of catering and industry requirements. Food economics and the role of processed foods. Food standards, grades and regulations. Trade practices. Beverage operations and regulations. Elementary principles of management.

3 class hours. Credit, 3.
9:00-9:50 M. W. F. MR. BAKER.

67. (I) Food Preparation and Service

Catering; quantity production with commercial types of equipment—baking, sauces, pastries; radar cookery. Actual participation at one of the University kitchens and in catering at special events.

1 class hour; 1 4-hour laboratory period. Credit, 3.
11:00-11:50 Tu.; laboratory hours by arrangement. MR. COURNOYER.

68. (II) Kitchen Administration

A general study of problems arising in operation of a commercial kitchen. Attention is given to layouts and floor plans with emphasis on equipment, design, installation, maintenance, sanitation and depreciation. Food control and economy. Considerable time is devoted to personnel procurement and training problems, job breakdown and specifications. Various types of table service and highlights of dining room supervision are included.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 M. F.; laboratory hours by arrangement. MR. COURNOYER.

77. (I) Food Service Practices

Functional study of personnel. Duties of managers, stewards, cooks, etc. Menu making; types of catering service. Advertising and promotion methods. Requirements for special functions. Labor procurement and policies. Job training and evaluation. Cost controls.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; laboratory hours by arrangement. MR. BAKER.

78. (II) Stewarding

This is a study of practices used by hotels and restaurants pertaining to purchasing, receiving, and issuing food, beverages, and other supplies. It in-

cludes storeroom procedures, issue systems, and internal check methods, principles of food and beverage cost control, menu planning and pricing.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. Baker, Mr. Cournoyer.

FORESTRY AND WILDLIFE MANAGEMENT

Professor Rhodes, Professor Holdsworth, Professor Trippensee, Associate Professor Rich, Assistant Professor MacConnell, Assistant Professor Mader, Mr. Cole*, Mr. Abbott, Mr. Bond.

25. (I) Wood Anatomy and Identification

A basic anatomical study of wood elements, their various structural characteristics and functions. Relation of structure and properties to use. Microscopic study of wood elements. Practice in identification.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Rich.

26. (II) Dendrology

The taxonomic features, silvical characteristics and geographical distribution of the principal forest trees of temperate North America, and the description of the forests in which they occur; identification of the native and naturalized woody plants occurring in the forests of the Northeastern United States, in summer and winter conditions, by means of keys and first-hand examination.

2 class hours; 2 2-hour laboratory and field periods. Credit, 3.
Mr. Rhodes, Mr. Abbott.

51. (I) Forest Management of Watersheds

For students majoring in bacteriology and public health. Admission on recommendation of student's major adviser. A study of forest site—water factor relationships; the improvement of watershed forests through applied silviculture; relative suitability of tree species for watershed uses; forest protection measures.

3 class hours; special field trips. Credit, 3.
Mr. Holdsworth.

53. (I) Silvics

Forest ecology as a foundation for silvicultural practice: the physiological basis of forest ecology; environmental factors, their effect upon vegetation, and how they are influenced by it; the development and silvical habits of the individual tree; the development, characteristics and classification of forest communities; plant indicators; methods for the study and analysis of vegetation and its environment.

2 class hours; 1 4-hour laboratory and field period. Credit, 3.
Mr. Rhodes

54. (II) Forest Soils

The structure, development and maintenance of forest soils; their relationship to applied silviculture and forest productivity; the literature of forest soils with special reference to American experience.

3 class hours. Credit, 3.
Mr. Mader.

* On leave of absence for military service.

55. (I) (1957-58) and (Summer) The Elements of Forest Mensuration

Methods of determining the volume and value of the forest growing stock; type mapping as it pertains to timber cruising; the field work includes mapping and timber estimating on forests realistic in size and condition and the submission of inventory reports. Given each summer and in alternate years the first semester.

2 class hours; 1 4-hour laboratory and field period. Credit, 3.
Summer course: 3 44-hour weeks. Mr. MacConnell, Mr. Bond.

56. (II) The Principles of Silviculture

The methods of establishing and developing forest stands through the application of correct silvicultural practice. Intermediate cuttings and reproduction systems. Field work in applied silviculture, including the marking of forest stands for silvicultural treatment, is given on University forest property.

2 class hours; 1 4-hour laboratory period. Credit, 3.
Mr. Rhodes, Mr. Abbott.

57. (I) Forest Economics and Policy

This course considers the forest as a resource yielding direct forest values and social benefits. The history of American forestry and the development of a forest policy together with the role of the forest in American economy are considered.

3 class hours. Credit, 3.
Mr. Holdsworth.

59. (I) Forest Protection

The principles of protecting forests from all harmful agencies but with special reference to the prevention and control of forest fires, insects, and disease. Other agencies are treated in accordance with their importance.

3 class hours. Credit, 3.
Mr. Abbott.

62. (II) The Management and Uses of Farm Forests

A study of the production of wood as a crop from forest land associated with farm enterprise. Silvicultural methods to improve wood quality and increase quantity; the measurement of timber volumes and growth rates; the grading, measurement, and use of forest products. Open to non-majors only.

2 class hours; 1 4-hour laboratory period. Credit, 3.
Mr. Bond.

71. (I) Aerial Photogrammetry

Principles of photogrammetry leading to the application of aerial photography in forest management, wildlife biology, engineering, geology, and other fields dealing with large land surfaces. Photographic interpretation and map making from aerial photographs are laboratory activities.

2 class hours; 1 4-hour laboratory period. Credit, 3.
Mr. MacConnell, Mr. Bond.

75. (I) Manufacture and Distribution of Forest Products

A study of the techniques of manufacturing forest products, including production and cost studies; also the seasoning, grading and special processing prerequisite to marketing.

3 class hours. Credit, 3.
Mr. Rich.

76. (II) Wood Technology

The structure, composition and properties of wood in relation to its economic utilization; wood-liquid relationships as they affect seasoning, preservation, and technological process for industrial purposes. A survey of the technological advances in the use of wood.

3 class hours. Credit, 3.

Mr. Rich.

78. (Summer) Harvesting of Forest Products

Primarily a field course designed to give students practice in the actual harvesting and preparation of direct forest products from the felling of standing timber through the log-making, skidding, transportation and sawing processes to the stacking of lumber. This part of the course is given on University owned forest land and at the mill of a private cooperator. Short field trips are made to active forest properties where harvesting is proceeding and a longer trip is made to New Hampshire and Maine to visit pulpwood and timber operations and manufacturing plants. Lectures and classwork survey the theory and practice of forest harvesting in the several U. S. forest regions.

3 44-hour weeks. Credit, 3.

Mr. Bond, Mr. MacConnell.

80. (II) Principles of Forest Management

The organization of the forest for sustained yield management with a study of the underlying principles. Forest regulation. The preparation of forest management plans.

3 class hours. Credit, 3.

Mr. MacConnell.

81. (I) Regional Silviculture

The practice of silviculture as applied in the several forest regions of the United States with special reference to the treatment of the tree species of commercial importance. Emphasis is given to the factors, both natural and economic, which govern silviculture in these regions.

3 class hours. Credit, 3.

Mr. Rhodes.

82. (II) Seeding and Planting in the Practice of Forestry

A study of forest tree seeds and their characteristics, production, harvest, storage, and qualities of germination. The production, distribution, and forest use of planting stock.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Abbott.

85. (I) Air Seasoning and Kiln Drying

A study of the proper conditioning of wood products by air seasoning and kiln drying, of moisture relation in the wood, and of kiln operation.

3 class hours. Credit, 3.

Mr. Rich.

WILDLIFE MANAGEMENT

27. (I) Conservation of Natural Resources

Natural resources of the United States including soil, water, forests, wildlife, and the important minerals, the historic background of their use and their present status in relation to the social and economic welfare. Includes the discussion of various conservation problems in relation to national prosperity.

3 class hours. Credit, 3.

10:00-10:50 M. W. F. Mr. Trippensee.

52. (Summer) Conservation of Natural Resources

A study of the conservation of basic natural resources including soil, water, forests, wildlife, metallic and non-metallic minerals, and the sources of energy including atomic energy. Not open for credit to those having credit in Wildlife Management 27.

3 2-hour and 2 4-hour laboratory periods. Credit, 4.

Mr. Trippensee.

70. (II) Wildlife Management

Life histories, ecology, and management of common game birds and mammals. Includes a study of natural habitats and methods of management.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Trippensee.

71. (I) Wildlife Management (1958-59)

Life histories, ecology, and management of waterfowl. Includes a study of natural habitats and method of management. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

11:00-11:50 Tu.; 3:00-4:50 Tu. Th. Mr. Trippensee.

72. (II) Forest-Animal Relationships

For students majoring in Forestry. Effects of animals on the forest; the effects of forest practices on wild animal production; economic aspects of forest-animal relationships.

3 class hours. Credit, 3.

10:00-10:50 M. W. F. Mr. Trippensee.

73. (I) Wildlife Management

Life histories, ecology, and management of predaceous birds and injurious mammals. Particularly designed for those who seek employment with rodent control division of U. S. Fish and Wildlife Service.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Trippensee.

74. (II) Techniques in Wildlife Management (1956-57)

Admission by permission of instructor. Quantitative field studies of wild animals of forest and farm. Includes cover mapping, habitat studies, census, food habits, and damage of game animals. For students interested in state and federal employment through civil service. Given in alternate years.

1 class hour; 1 4-hour laboratory period. Credit, 3.

1:00-1:50 W.; 1:00-4:50 M. Mr. Trippensee.

75. (I) Wildlife Management (1957-58)

Life histories, ecology, and management of the furbearers. Includes a study of natural habitats, management and fur farm problems. Given in alternate years.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

11:00-11:50 Tu.; 3:00-4:50 Tu. Th. Mr. Trippensee.

84. (II) Seminar (1957-58)

Study and discussion of problems in relation to agriculture, forestry, and the use and control of wildlife resources. For juniors and seniors majoring in wildlife management. Given in alternate years.

3 class hours. Credit, 3.

Mr. Trippensee.

GEOLOGY AND MINERALOGY

PROFESSOR SMITH, ASSOCIATE PROFESSOR SOCOLOW, ASSISTANT PROFESSOR NELSON, ASSISTANT PROFESSOR JOHANSSON, MR. RICE, MR. DODGE, MR. PARKS, MR. BAZAKAS.

1. (I) Physical Geology

An introduction to the agents and processes that modify the earth's crust. Field trips by arrangement.

2 class hours; 1 quiz hour; 1 2-hour laboratory period. Credit, 3.

THE DEPARTMENT.

28. (II) Historical Geology

A survey of geological time, stressing the development of continents and the history of plants and animals. Field trips by arrangement.

2 class hours; 1 quiz hour; 1 2-hour laboratory period. Credit, 3.

THE DEPARTMENT.

50. (I) Engineering Geology

A general course in engineering geology stressing earth structure, the dynamic processes, and agents of weathering. The laboratory work consists of mineral and rock-determination and map-reading as related to the phenomena of physical geology.

2 class hours; 1 3-hour laboratory period. Credit, 3.

MR. SOCOLOW.

51. (I) 52. (II) Mineralogy

A course designed to meet the needs of students majoring in geology and allied fields. The first semester's work deals with all of the mineral classes with the exception of the silicate group which has been reserved for the second semester.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

MR. NELSON.

Prerequisites, Chemistry 1 and 2.

54. (II) Economic Geology

A course dealing with the origin, classification, and uses of metallic and non-metallic mineral deposits.

2 class hours; 1 2-hour laboratory period. Credit, 3.

MR. SOCOLOW.

56. (II) Lithology

A descriptive study of the classes of rocks with reference to manner of origin, modes of occurrence, structural features and the chemical and petrographic distinction within each group.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

MR. NELSON.

60. (II) Principles of Physical Geography

A systematic study of the world's physiographic provinces, climate, vegetation, soils, mineral resources, and their effects upon mankind. The geographic relationships to land forms will be stressed.

3 class hours. Credit, 3.

MR. JOHANSSON.

61. (I) Geomorphology (1956-57)

A review of recent studies concerning rock structures, weathering, streams, underground water, shorelines, wind work, volcanoes, and mountains. Field trips by arrangement.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Smith.

62. (II) Pleistocene Geology (1956-57)

A study of Pleistocene world geology consisting of geological processes, land forms, existing and extinct glaciers, biota and stratigraphy. Field trips by arrangement.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Smith.

63. (I) Invertebrate Paleontology

A study of the history, development and identification of invertebrate animal fossils. Field trips by arrangement.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Johansson.

64. (II) Plant Paleontology

A study of the history, development, and identification of plant fossils. Field trips by arrangement. Not offered 1956-57.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
The Department.

71. (I) 72. (II) Special Problems

For seniors specializing in geology.

6 laboratory hours. Credit, 3.

Hours by arrangement. The Department.

73. (I) Structural Geology

A study of the origin of rock structures, their occurrence, and recognition. Field and laboratory problems emphasize the structure present in the Connecticut valley.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Socolow.

74. (II) Principles of Stratigraphy

An examination of the principles of stratigraphic correlation and their application to the problems of the major rock units of the United States. Field and laboratory work consists primarily of problems related to the eastern United States.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Mr. Dodge.

GERMAN

Professor Ellert, Associate Professor Heller, Mr. Stawiecki, Mr. Lea, Miss Schiffer, Miss Welt.

1. (I) 2. (II) Elementary German

Grammar, prose composition, and reading. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Provost.

3 class hours. Credit, 3.
The Department.

25. (I) 26. (II) Intermediate German

German prose, poetry and drama. Grammar review.

3 class hours. Credit, 3.

The Department.

Prerequisites, German 1 and 2.

28. (II) Scientific German

Intensive and extensive readings of scientific texts in various fields taken from standard German works.

3 class hours. Credit, 3.

The Department.

Prerequsites, German 25.

51. (I) Nineteenth Century Prose (1956-57)

A study of the *Novelle* from the death of Goethe to 1890 (early realism to naturalism) with emphasis on literary and social forces in the work of Tieck, Stifter, Keller, and others. Given in alternate years.

3 class hours. Credit, 3.

Mr. Heller.

Prerequisites, German 25 and 26.

52. (II) Poetry and Drama of the Nineteenth Century (1956-57)

A study of the development of the drama and of lyric poetry from 1830 to 1890 with special emphasis on dramatic works of Grillparzer, Hebbel, and Hauptmann and the poetry of Mörike, Storm, and C. F. Meyer. Given in alternate years.

3 class hours. Credit, 3.

The Department.

Prerequisites, German 25 and 26.

53. (I) Twentieth Century Prose (1957-58)

Main literary currents in contemporary German prose from Nietzsche to Hesse with particular attention to the work of Thomas Mann, Kafka, and Werfel. Given in alternate years.

3 class hours. Credit, 3.

Mr. Heller.

Prerequisites, German 25 and 26.

54. (II) Poetry and Drama of the Twentieth Century (1957-58)

Reading and discussion of significant lyrical works of Hofmannsthal, George, and Rilke, and representative dramas by Hauptmann and Georg Kaiser. Given in alternate years.

3 class hours. Credit. 3.

The Department.

Prerequisites, German 25 and 26.

55. (I) Storm and Stress

A study of storm and stress in German literature centering in the young Goethe.

3 class hours. Credit, 3.

Mr. Ellert.

Prerequisites, German 25 and 26.

56. (II) Romanticism (1956-57)

A study of the poetry and prose writings of the romantic period from Novalis to Heine. Given in alternate years.

3 class hours. Credit, 3.

Mr. Ellert.

Prerequisites, German 25 and 26.

57. (I) Goethe's *Faust*

3 class hours. Credit, 3.

The Department.

Prerequisites, German 25 and 26.

58. (II) Middle High German (1956-57)

Readings of Middle High German texts in the original with an introduction to the grammar. Given in alternate years.

3 class hours. Credit, 3.

The Department.

Prerequisites, German 25 and 26.

59. (I) The Germanic Languages (1957-58)

An introduction to general and Germanic philology for German and English majors; a survey of the relationship between German, English, and the other Indo-European tongues and of the historical development of German and English as the two major Germanic literary languages. Given in alternate years.

3 class hours. Credit, 3.

The Department.

60. (II) The Classical Period (1957-58)

A study of representative works by Lessing, Goethe, and Schiller. Given in alternate years.

Mr. Heller.

Prerequisites, German 25 and 26.

68. (II) German Literature of the Middle Ages (1957-58)

A survey of the literature of the German language from the earliest literary documents to the 15th century, with readings in modern German translation of the Nibelungenlied, Gudrun, Parzival, Tristan, Der arme Heinrich, and the lyrics of Walter von der Vogelweide. Given in alternate years.

3 class hours. Credit, 3.

Mr. Ellert.

79. (I) 80. (II) German Conversation and Composition

Practice in the oral and written language.

4 class hours. Credit, 3.

3:00-4:50 Tu. Th. Miss Schiffer.

Prerequisites, German 25 and 26, or permission of instructor

GOVERNMENT

Professor Harris, Associate Professor Goodwin, Assistant Professor Tinder†, Assistant Professor Allen, Mr. Mainzer, Mr. Braunthal, Mr. Hampton.

25. (I) and (II) American Government

A study of the principles, machinery, dynamics and problems of government in the United States.

3 class hours. Credit, 3.

The Department.

26. (II) European Government

A survey of the politics and governmental institutions of Great Birtain, France, U. S. S. R., and other European countries.

3 class hours. Credit, 3.

Mr. Allen, Mr. Harris, Mr. Tinder, Mr. Braunthal.

51. (I) Municipal Government

A survey of the governmental structure and function of American municipalities.

3 class hours. Credit, 3.

Mr. Goodwin, Mr. Gillespie.

52. (II) American Foreign Policy

An analysis of the principles of American foreign policy. Constitutional, political, and administrative considerations which influence the formulation and execution of American foreign policy. Special emphasis on current issues.

3 class hours. Credit, 3.

Mr. Allen, Mr. Braunthal.

53. (I) International Relations

The nation-state system and conceptions of national interest in modern world politics. The forms and distribution of power by which states seek to implement national interests. The making of foreign policy and methods of adjusting international conflict. Attention will be given to current international problems.

3 class hours. Credit, 3.

Mr. Allen.

54. (II) State Government (1957-58)

A study of state politics, organization and functions, with emphasis on the role of the state in our Federal system. Given in alternate years.

3 class hours. Credit, 3.

Mr. Goodwin.

55. (Summer) The Presidency in American Government

The growth of the executive in United States Government. Varying conceptions of the presidential office. Constitutional and political aspects of the office in legislation, administration and conduct of foreign and military affairs. The president as party leader.

5 periods a week for 6 weeks. Credit, 3.

Mr. Braunthal.

Prerequisite, Government 25.

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† On leave of absence.

56. (II) The Legislative Process (1956-57)

A study of the role of the legislature in national and state government. The functions of legislatures, legislative procedures, and the role played by political parties and pressure groups in the legislative process. Given in alternate years.

3 class hours. Credit, 3.

Mr. Goodwin.

61. (I) Public Administration

A study of organization and management in modern government, with emphasis on the bureaucracy's role in public policy formation.

3 class hours. Credit, 3.

Mr. Mainzer.

62. (II) Administrative Law (1957-58)

A study of governmental activities in the regulation of industry, agriculture, and labor, with emphasis on the legal framework within which these activities operate. Given in alternate years.

3 class hours. Credit, 3.

Mr. Mainzer.

63. (I) Political Parties and Elections

A study of the American political process, with emphasis on parties, pressure groups, and public opinion.

3 class hours. Credit, 3.

Mr. Goodwin.

65. (I) Constitutional Law

An historical study of the United States Constitution as interpreted by decisions of the Supreme Court.

3 class hours. Credit, 3.

The Department.

66. (II) American Political Thought

A study of the development of American political thought from colonial times to the present.

3 class hours. Credit, 3.

The Department.

68. (II) International Law (1957-58)

A study of the origin, character, and function of international law. Given in alternate years.

3 class hours. Credit, 3.

Mr. Braunthal.

70. (II) International Organization (1956-57)

A study of international organization in the twentieth century, with emphasis upon the United Nations and regional organizations. Given in alternate years.

3 class hours. Credit, 3.

Mr. Braunthal.

71. (I) Ancient and Medieval Political Thought

A study of the development of political thought and its relation to cultural and institutional growth from the time of the Greeks to the end of the Middle Ages.

3 class hours. Credit, 3.

Mr. Tinder, Mr. Hampton.

72. (II) Modern Political Thought

A study of the development of political thought and its relation to cultural and institutional growth from the rise of the modern state to the present.

3 class hours. Credit, 3.

Mr. Tinder, Mr. Hampton.

73. (I) Comparative Government

A functional analysis of contemporary governments with special attention to the ideology, structure, and dynamics of political parties.

3 class hours. Credit, 3.

Mr. Allen, Mr. Harris.

Prerequisite, Government 26.

76. (II) Public Opinion in Politics (1956-57)

A study of opinion and communication as aspects of the political process with emphasis upon communication through mass media. Examination of the relations between mass attitudes and communication and political institutions and the formation of public policy. Given in alternate years.

3 class hours. Credit, 3.

Mr. Mainzer.

78. (II) Municipal Administration (1956-57)

A study of administrative management in American municipalities based on descriptive literature, case materials, and personal observation, with particular attention to Massachusetts cities and towns. Given in alternate years.

3 class hours. Credit, 3.

Mr. Gillespie.

80. (II) Municipal Law (1957-58)

A study of the legal problems encountered in the creation and operation of local government, with special reference to Massachusetts cities, towns, and counties. Given in alternate years.

3 class hours. Credit, 3.

Mr. Gillespie.

93. (I) 94. (II) Seminar

A study of special problems in the field of government.

3 class hours. Credit, 3.

The Department.

GREEK

Instructor in Languages.

1. (I) 2. (II) Elementary Greek

An intensive study of the essentials of the language and the reading of simple selections from classical Greek prose and poetry.

3 class hours. Credit, 3.

The Department.

5. (I) 6. (II) Intermediate Greek

A review of the elements of the language. Selected readings in the Homeric epics and the dialogue of Plato. Study of the Iliad will be the focal point of the course.

3 class hours. Credit, 3.

The Department.

Prerequisites, Greek 1 and 2, or two years of high school Greek.

HISTORY

Professor Caldwell, Professor Cary, Associate Professor Davis, Associate Professor Zeender, Assistant Professor Pflinze†, Assistant Professor Potash†, Assistant Professor Kingdon, Mr. Gagnon, Mr. Dietel, Mr. Higham, Mr. Brown, Mr. Greenbaum, Mr. Conhaim, Visiting Lecturer Monas.

5. (I) 6. (II) Modern European Civilization

The first semester covers the period from the later Middle Ages to 1815; the second semester, the period from 1815 to the present. These courses are required of candidates for the B.A. degree but may be elected independently by other students.

3 class hours. Credit, 3.

The Department.

31. (I) 32. (II) English History

Emphasis on economic, social, and cultural influences, as well as on constitutional development. Either semester may be elected independently.

3 class hours. Credit, 3.

Mr. Caldwell, Mr. Dietel.

51. (I) Ancient History

A general survey of Mesopotamian, Egyptian, Greek, and Roman history, with primary emphasis on cultural and intellectual achievements.

3 class hours. Credit, 3.

Mr. Davis.

54. (II) The Far East (1956-57)

A general historical introduction to the civilization and contemporary problems of China and Japan. The first half covers the traditional civilization of China and Japan and the early impact of the west to 1890. The second half deals with revolutionary developments of the twentieth century and the place of the Far East in the world balance of power. Given in alternate years.

3 class hours. Credit, 3.

Mr. McCune, Mr. Kingdon.

56. (I) History of Russia (1958-59)

A general historical introduction to the civilization and contemporary problems of Russia. Growth of the Russian state, society, culture and ideology, and their relations to the non-Russian world. Emphasis on the Soviet period. Given in alternate years.

3 class hours. Credit, 3.

Mr. Gagnon.

† On leave of absence.

57. (I) 58. (II) Hispanic-American History

The first semester deals with the colonial period: the age of the "conquistadores", political, economic, and cultural developments, and growth of the independence movement; the second semester with the period of national development from 1810 to the present. Emphasis will be given to the history of Mexico and the more important South American countries. Either semester may be elected independently. Not offered in 1956-57.

3 class hours. Credit, 3.

Mr. Potash.

59. (I) 60. (II) History of the United States

A survey of the national development including political, social, economic, and cultural factors in the growth of American democracy. The first semester covers the period to 1865; the second, from 1865 to the present. Either semester may be elected independently.

3 class hours. Credit, 3.

Mr. Cary, Mr. Davis, Mr. Brown.

62. (II) Medieval History

Europe from the collapse of Roman civilization to the Renaissance. Fusion of the Graeco-Roman inheritance, Christianity, and Germanic traditions in the building of Western European civilization. The medieval outlooks as expressed in the thought and culture of the High Middle Ages.

3 class hours. Credit, 3.

Mr. Zeender.

Prerequisite, History 32.

63. (I) 64. (II) History of American Thought and Culture

A study of the basic strands of American thought and their reflection in the development of social life and institutions, literature, and the arts. The first course covers the period to 1865. Either semester may be elected independently.

3 class hours. Credit, 3.

Mr. Brown.

66. (II) The History of Modern Germany

The evolution of Germany since 1750 in relationship to Western Europe. An analysis of those economic, social, political, and intellectual influences which determined the unique direction of German cultural development. A study of the Nazi revolution and contemporary Germany.

3 class hours. Credit, 3.

Mr. Pflanze.

69. (I) Europe, 1870-1918

Internal developments of the principal countries, including political and economic changes, social unrest, and intellectual currents; the development of imperialism; a detailed study of conditions and diplomacy which led to the World War; military history of the War.

3 class hours. Credit, 3.

Mr. Zeender.

Prerequisite, History 6.

70. (II) Europe Since 1918

Approximately half of the course is devoted to international affairs, including the Peace Settlement, the development of German, Italian, and Japanese

aggression, and World War II. The other half of the course is a study of internal developments in the principal European nations.

3 class hours. Credit, 3.

Mr. Caldwell.

71. (I) Main Currents in English Thought, 1600-1900

A study of leaders of thought and the climate of ideas in selected periods, with emphasis on the relationship of ideas to outstanding historical events.

3 class hours. Credit, 3.

Mr. Caldwell.

72. (II) History of American Westward Expansion, 1763-1893

Advance of settlement from the Appalachians to the Pacific and influence of the frontier upon social, economic, and political conditions in the country as a whole.

3 class hours. Credit, 3.

Mr. Davis.

Prerequisite, History 59.

73. (I) History of the Renaissance

The later Middle Ages; the Church at the height of power; the rise of nationalities; the Italian towns; the New Learning and its relation to art, science, invention, geographical discoveries; spread and effects of the Renaissance.

3 class hours. Credit, 3.

Mr. Kingdon.

74. (II) Age of Reformation

A study of the religious changes, and the accompanying political upheavals, and the social, economic, and cultural developments in 16th and 17th century Europe.

3 class hours. Credit, 3.

Mr. Kingdon.

79. (Summer) New England to 1860

A study of the colonial and early national periods, with emphasis on the political, social, and economic aspects of life in this region.

30 class periods. Credit, 3.

Mr. Cary.

81. (I) 82. (II) Diplomatic History of the United States

The development of American foreign relations, 1776 to the present. Either semester may be elected independently.

3 class hours. Credit, 2 or 3.

Mr. Cary.

Prerequisites, History 59, 60, or permission of the instructor.

91. (I) Seminar

Instruction in bibliography, evaluation of source materials and preparation of reports.

1 class hour. Credit, 1.

The Department.

92. (II) Historiography

Critical evaluation of representative historians from ancient to modern times.

1 class hour. Credit, 1.
Mr. Davis.

HOME ECONOMICS

Professor Mitchell, Associate Professor Briggs, Associate Professor Merriam, Associate Professor Cook, Assistant Professor Davis, Assistant Professor McCullough, Assistant Professor Strattner, Assistant Professor Wilhelm, Assistant Professor Hawes, Mrs. Thies, Mrs. Esselen, Miss Geiger.

3. (I) Nutrition

The fundamental principles of nutrition and their application to individual and family food habits.

3 class hours. Credit, 3.
Miss Mitchell.

4. (II) Textiles

This course is designed to give the student an introduction to the characteristic properties and uses of natural and synthetic fibers; the conversion of fiber to finished fabrics; fabric identifications; buying and use of fabrics for clothing and home use.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Miss Hawes.

25. (I) Consumer Clothing Problems

This course consists of three fundamental approaches to clothing problems: consumer education in relation to economics in the field of ready-to-wear; a study of art and psychology applied to the selection of apparel; and basic principles of construction.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mrs. Wilhelm, Miss Hawes.

30. (II) Food Science and Preparation

A study of the fundamental scientific principles and comparative methods of food preparation. The nutritional and economic aspects of foods are also stressed.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Miss Davis.

31. (I) Applied Art

Art principles are studied with many practical applications for selecting and arranging. Specific problems in decorating cloth, wood, and leather afford opportunity for individual expression.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Miss Briggs.

35. (I) and (II) Clothing Construction

Advanced construction and fitting problems with emphasis on new fabrics. In the latter part of the semester provision is made for individual development in the field of clothing in which the student is interested, either in advanced construction problems or in creative pattern drafting.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mrs. Wilhelm, Miss Hawes.

Prerequisite, Home Economics 25 or equivalent.

41. (I) Nutrition and Food Preparation (For Nurses)

This course combines the fundamentals of nutrition with food preparation and meal planning to meet nutritional requirements. The content and emphasis is appropriate for nurses whose responsibilities will be mostly with their patients. Admission by permission of instructor.

3 class hours; 1 2-hour laboratory period. Credit, 4.
Mrs. Cook.

Prerequisites, Chemistry 1 and 2; Zoology 35.

42. (II) Medical Dietetics (For Nurses)

The principles and practice of dietary restrictions and modifications recommended for certain diseases, always keeping in mind the nutritional needs of the individual. Students learn to use current medical literature for supplementary reference in connection with new developments.

2 class hours. Credit, 2.
Mrs. Cook.

Prerequisite, Home Economics 41 or equivalent.

51. (I) Meal Planning

Meal planning, serving and etiquette. Emphasis on nutritional needs; management of money, time and labor in selection, planning, preparation, utilization, and care of food. Further study of food principles and techniques of cookery and short units in food preservation, freezing, canning, and outdoor cookery.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Miss Davis.

Prerequisite, Home Economics 30; Chemistry 33 or equivalent.

52. (II) Nutrition and Dietetics

A study of the fundamentals of normal nutrition including energy needs, the metabolism of proteins, carbohydrates, fats, vitamins, and minerals; and the quantitative requirements for these various essential nutrients. Laboratory work provides for further study of the composition of foods and their contribution to the diet and the relationship of the nutritive value to cost. Nutritive loss due to cooking, storage, etc., is given consideration.

3 class hours; 1 2-hour laboratory period. Credit, 3.
Mrs. Cook.

Prerequisites, Home Economics 30; Chemistry 33 and Zoology 1 or 35.

54. (II) Nutrition

For students who are not majoring in Home Economics and who do not have prerequisites for Home Economics 52. This course is designed to interpret the technical knowledge of foods and nutrition in terms of its practical application for optimum health.

3 class hours. Credit, 3.
Mrs. Cook.

56. (II) Meal Planning

This course is designed to meet the needs of those who wish a general knowledge of the basic food principles. It includes latest methods and techniques of cookery, conservation of nutrients, menu planning and food preparation, buying of food, consumer education and table service, decoration and

etiquette. It is recommended for students who want a scientific as well as practical knowledge of food and its preparation for everyday use.

2 class hours; 1 3-hour laboratory period. Credit, 3.
The Department.

60. (II) Household Equipment

A study of selection, care, and operation of household equipment and the mechanical principles involved. Actual work with equipment and field trips are included.

1 class hour; 1 3-hour laboratory period. Credit, 2.
Miss Merriam.

61. (I) Demonstration Techniques

Emphasis is given to the purposes and techniques of demonstration both in preparation of food and the use of equipment, with application to teaching, extension, and business.

2 2-hour laboratory periods. Credit 2.
Miss Davis.

Prerequisites, Home Economics 30.

62. (II) Home Furnishing

A study of the fundamental principles which underlie the successful planning and furnishing of a satisfying home. A study of period homes and furnishings is included. Many applications of these principles are worked out in practical problems.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Miss Briggs.

63. (I) Arts and Crafts

Introduction to design and execution in crafts particularly adapted to work with children in schools, playgrounds, summer camps; and for any age in recreational leadership and occupational therapy. Opportunity will be offered for work in several of the following: wood and leather work, block printing, finger-painting, etching, knotting, etc.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Miss Briggs.

70. (I) and (II) Child Development

The growth and development of the child, his basic needs, aspects of behavior-routine, creative and social—as they are related to personality development. Planned observation and participation in nursery school.

3 class hours; 1 1-hour laboratory period. Credit, 3.
Mrs. Thies.

71. (I) Retail Food Buying

This course is offered jointly by the departments of olericulture, animal husbandry, and poultry husbandry and home economics for all students interested in retail marketing. First period—vegetables and fruits; retail buying, varieties and adaptability to various uses, season of availability, grades, packs and packages. Second period—poultry and eggs; —dressed poultry is graded and prepared in various ways for the table and home freezing. Demonstrations are given of handling and marketing classification of eggs. Third period—meats; —demonstration and laboratory practices in identification and classification of meat cuts, in preservation (freezing and curing) and in judging quality.

Fourth period—processed and packaged foods: a survey of new developments in relation to both their monetary economy and convenience to the retail food buyer.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Snyder, Mr. Vondell, Mr. Adams.
Mrs. McCullough, coordinator.

75. (I) Economics of the Household

A study of personal and family standards of living in the modern home, the economic relations of the household, and the use of time, energy, and money as a means to influence the home situation.

3 class hours. Credit, 3.

Miss Merriam, Miss Geiger.

77. (I) and (II) Home Management Practice

Successive groups of seniors live in the home management house or apartment and assume responsibilities involved in managing a home. Meals are planned on low, medium, and high income levels.

Credit, 3.

Miss Merriam, Miss Geiger.

Prerequisites, Home Economics 51 or 56, 52 or 54, and 75, or by special permission.

78. (II) Advanced Textile Design

Weaving and handling of complicated looms. Other types of textile design such as stenciling, silk screen printing, batik, block print, with individual problems dependent on the student's special interests.

1 class hour; 2 3-hour laboratory periods. Credit, 3.

Miss Briggs.

Prerequisite, Home Economics 31 or its equivalent.

80. (II) Family Life

A study of the modern family; ideals and responsibilities of the home and the individual's share in developing positive family relationships.

3 class hours. Credit, 3.

Miss Strattner.

81. (I) Methods of Teaching Home Economics

A study of the philosophy of general education; the application of home economics to the entire school program; development of curricula based upon student needs; exploration of instructional methods and techniques. This course gives credit toward meeting state standards for teachers.

3 class hours. Credit, 3.

Miss Strattner.

85. (I) Theory and Practice of Nursery School Management

This course is planned to give students a background in the history and philosophy of the pre-school program; theory and techniques of nursery school practice; children's activities in music, art, literature, and science; fundamentals of play and use of play materials, and methods of observation and recording. Supervised participation in child development laboratory as well as field trips to observe special groups.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mrs. Thies.

Prerequisite, Home Economics 70.

86. (Summer) Workshop in Recent Developments in Textiles

This course is a concentrated study of recent developments in the field of textiles. Instruction will include the characteristics and properties of the thermoplastic, protein, cellulose and mineral fibers (natural and synthetic); blends; fabric finishes and fabric care. Some field trips are an important phase of the work.

2 lecture hours and 2 laboratory hours daily for fifteen days. Credit, 3.
Miss Hawes.

Prerequisite, Home Economics 4 or its equivalent.

87. (I) Principles and Practices of Tailoring

Emphasis on handling of wool in the making of suits and coats.

1 class hour; 1 4-hour laboratory period. Credit, 3.
Mrs. Wilhelm, Miss Hawes.

Prerequisite, Home Economics 35 or equivalent.

88. (II) Applied Dress Design

Costume design through draping and pattern making. An intensive study is made of texture, line, color and fit as applied to dress design and the figure.

3 2-hour laboratory periods. Credit, 3.
Mrs. Wilhelm.

Prerequisite, Home Economics 35 or equivalent.

89. (I) Diet Therapy

The application of nutrition principles to diet in disease. Recent theories of dietary treatment of gastro-intestinal disorders, obesity, anemia, fevers, diabetes, food allergy, cardiovascular and biliary tract diseases are reviewed critically. Students are required to use and be familiar with current medical literature as it applies to nutritional problems in disease and at the same time be open-minded regarding new developments in this field. Scientific and medical terminology is emphasized.

3 class hours. Credit, 3.
Mrs. Cook.

Prerequisites, Home Economics 52; Chemistry 79; Zoology 35.

90. (I) and (II) Professional Seminars

A one-credit seminar is offered in each of the five fields of subject matter: Nutrition, Textiles, Clothing, Foods, Institutional Administration, Home Management and Equipment, Family Life and Child Development. One seminar is required of each senior and permission may be granted to take as many as three of the five.

Credit, 1-3.
Home Economics Staff.

91. (I) 92. (II) Quantity Food Preparation and Institutional Administration

For qualified juniors or seniors interested in institutional food service. A study of the principles of organization, personnel management, the administration, food costs, operating expenses, and the special functions of the dietitian. Laboratory work is at one of the university dining halls and field trips are

planned. It is expected that students will enroll for the work of both semesters. Students wishing to qualify for administrative institutional work are advised to take Accounting 25 and Home Economics 71.

2 class hours, 1 4-hour laboratory period of field work. Credit, 3.
Mrs. McCullough

Prerequisites, Home Economics 51 and 52.

93. (I) Experimental Foods

The testing and comparing of different food materials and methods of preparation, including advanced work in the science and techniques of cookery. Special individual problems will be studied. The course is helpful to those interested in commercial food testing and valuable to those wishing to develop a scientific approach to the study of foods.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Miss Davis.

Prerequisite, Home Economics 30.

94. (Summer) Workshop in Foods

An intensive course dealing with the planning and preparation of family meals. Consideration will be given to new products, cost levels, new trends toward international foods, and out-door cookery. Designed for home economics teachers and others with a background knowledge of scientific food preparation. Limited to 16 students.

5 hours daily for three weeks. Credit, 3.
Miss Davis.

Prerequisite, Home Economics 30 or equivalent.

95. (I) Child Nutrition

A study is made of nutritional needs from prenatal life through infancy and childhood. Methods of judging nutrition, also causes and effects of malnutrition are discussed. Menus for children and measures to insure the consumption of optimal diets are put in practice with laboratory work in the Nursery School.

3 class hours. Laboratory by arrangement. Credit, 3.
Prerequisite, Home Economics 52 or 54. Mrs. Cook.

98. (I) and (II) Problems in Home Economics

An intensive study of some phase of home economics. By permission of the Staff adviser.

Credit, 3.
Home Economics Staff.

HYGIENE

Hygiene

All freshmen are required to attend a series of lectures on personal hygiene. For men students these lectures are included in the Military program; for women students they are scheduled as a separate course.

Credit, 1.
The Health Service Staff.

JOURNALISM

PROFESSOR MUSGRAVE.

75. (I) News Communication

A study of news writing and editing for the press, radio, and television. Stress is placed upon writing techniques for the efficient transmission of information, and upon concepts which seek to explain what happens in the process in which means are transmitted.

3 class hours. Credit, 3.

MR. SAVAGE.

83. (I) Community Journalism

A study of the weekly newspaper, the small-city daily, and the scholastic press, combined with training in copyediting. The University student publications and town newspapers are used as laboratories.

2 class hours; 1 laboratory period. Credit, 3.

MR. MUSGRAVE.

85. (I) Introduction to Mass Communication

Designed to acquaint the student with the scope, principles, and practice of contemporary journalism. Stress is placed upon the role of the press as a social institution and upon the relationships between a general education and effective journalism.

3 class hours. Credit, 3.

MR. MUSGRAVE.

86. (II) Feature Article Writing

Instruction in writing feature or magazine articles, combined with a study of the field of magazine journalism. The practice work is related to problems of interpretive writing and communication. Each student is expected to publish a feature article in a newspaper, a trade journal or other magazines.

3 class hours. Credit, 3.

MR. MUSGRAVE.

88. (II) Problems in Journalism

The readings cover selected areas of journalistic studies, such as civil rights and the press, language and communication, comparative foreign journalism, history of journalism, communication research methods, the criticism of mass media. Laboratory work for seniors is arranged on daily newspapers. Admission by permission of instructor.

2 class hours; 1 laboratory period. Credit, 3.

MR. MUSGRAVE.

90. (II) Language and Mass Communication

A study of major approaches to language problems from the viewpoint of their relevance to the mass communication media and to increased journalistic communication skill by students. Stress is placed upon interpreting the literature of empirical data and experimental research in this area of language studies as applied to mass communication.

3 class hours. Credit, 3.

MR. MUSGRAVE.

LANDSCAPE ARCHITECTURE

Professor Otto, Professor Blundell, Assistant Professor Procopio, Assistant Professor Hamilton, Mr. MacIver, Visiting Lecturer Bacon, Visiting Lecturer Gardner.

LANDSCAPE ARCHITECTURE

25. (I) Freehand Drawing and Elementary Design

The work in this course is to supply the student with technical aspects of freehand drawing and design necessary to proficiency in that field.

3 2-hour laboratory periods. Credit, 3.
Mr. MacIver.

26. (II) Landscape Drafting

This course continues the work in Landscape Architecture 25, but draws on the mechanical aspects of the designers problems and includes simple projections—orthographic, perspective, and isometric—and architectural shades and shadows.

3 2-hour laboratory periods. Credit, 3.
Mr. Procopio.

51. (I) Elements of Topography and Construction

Contour interpolation, grading and drainage, plans, drive design, profiles and sections, computation of earth work. Application of surveying to landscape construction.

3 2-hour laboratory periods. Credit, 3.
Mr. Hamilton.

Prerequisites: Civil Engineering 27; Landscape Architecture 26.

52. (II) Construction Details

A series of problems in architectural garden features as walks, steps, walls, gates, pools, and small structures.

3 2-hour laboratory periods. Credit, 3.
Mr. Hamilton.

Prerequisites, Landscape Architecture 51.

53. (I) Introductory Design

Fundamental principles of composition with application to problems in the design of gardens and small home grounds.

3 2-hour laboratory periods. Credit, 3.
1:00-2:50 M. W. F. Mr. Otto.
Prerequisites, Landscape Architecture 25 and 26 or permission of the instructor.

54. (II) General Design

A series of problems in the design of private properties and public works. Members of this class will be required to take a two-day field trip to visit typical examples of design; approximate cost, $15.00.

3 2-hour laboratory periods. Credit, 3.
1:00-2:50 M. W. F. Mr. Otto.
Prerequisites, Landscape Architecture 51, 53, and concurrently 52.

79. (I) Construction and Maintenance (1957-58)

A study of construction methods and materials as applied to the landscape field. Given in alternate years.

3 class hours. Credit, 3.
10:00-10:50 M. W. F. Mr. Procopio.

80. (II) History and Literature of Landscape Architecture

A review of the history and literature of landscape architecture and allied fields. Compilation of bibliographies of significant works.

2 class hours. Credit, 2.
8:00-8:50 Tu. Th. Mr. Otto.

81. (I) 82. (II) Advanced Design

Class B Exchange Problems plus specialized study of landscape details and a summary of general design. Members of the class may be required to take a two-day field trip to visit typical examples of design; approximate cost, $15.00.

3 2-hour laboratory periods. Credit, 3.
Mr. Procopio.

Prerequisites, Landscape Architecture 53 and 54.

83. (I) Architecture (1958-59)

The history of architectural development, including styles of architecture and construction principles of value to landscape architects when working with architectural problems. Given in alternate years.

3 class hours. Credit, 3.
Mr. Gardner.

84. (II) Sketching

Drawing and sketching in various mediums from outdoor and indoor subjects.

2 2-hour laboratory periods. Credit, 2.
Mr. MacIver.

86. (II) City Planning

A critical examination of those factors which influence and guide the physical growth and arrangement of communities in harmony with their social and economic needs.

3 class hours. Credit, 3.
Mr. Bacon.

87. (I) Projects in Planning

An application of the principles of modern civic art through a series of problems on the design of various types of urban land areas.

2 3-hour laboratory periods. Credit, 3.
Mr. Bacon.

Prerequisite, Landscape Architecture 86.

88. (II) Projects in Planning

A continuation of Landscape Architecture 87.

2 3-hour laboratory periods. Credit, 3.
Mr. Bacon.

HORTICULTURE

2. (II) Basic Horticulture

An introductory course for those interested in acquiring some basic knowledge of horticulturally important plants. It is concerned with the structure, flowering and fruiting habits, propagation, training, pruning, and storage of many of our economic plants as well as an introductory discussion of the influence of soil, nutritional status, environmental factors and growth regulating substances on their development.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Southwick, Mr. Anderson.

26. (II) Plant Materials

Detailed study of deciduous and evergreen trees, with special reference to their mature form and character, means of identification, natural associations, and uses of the various types of trees in landscape work.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Blundell.

51. (I) Plant Materials

Detailed study of shrubs and woody vines, and their identification, with special emphasis being given to their adaptability to the various landscape uses, methods of handling, and care.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Blundell.

52. (II) Planting Design

A study of the utilization of plant materials in combination as applied to the many conditions and demands of landscape work.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Blundell.

Prerequisites, Horticulture 26 and 51.

LATIN

Instructor in Languages.

1. (I) 2. (II) Elementary Latin

An intensive course in Latin grammar and reading. For those who have had no previous Latin. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Provost.

3 class hours. Credit, 3.

Mr. Greenfield.

5. (I) 6. (II) Intermediate Latin

An introduction to classical Latin literature: dialogues and oratory (Cicero), the epic (Virgil), lyric poetry (Catullus and Horace), historical prose (Livy), satire, comedy, and other genres.

3 class hours. Credit, 3.

Mr. Greenfield.

Prerequisites, Latin 1 and 2, or 2 years of high school Latin.

MATHEMATICS

Professor Andersen, Professor Wagner, Associate Professor Boutelle, Associate Professor Rose, Associate Professor Cullen, Assistant Professor Moser, Mr. Skillings, Mr. Allen, Mr. Bussel, Mr. Watson, Mr. Naylor, Mrs. Rice, Miss Cook, Miss Navratil, Mr. Thomas, Mr. Trahan, Mr. Durfee, Mr. Libera, Mrs. Stockton, Mr. Pavelcak.

01. (I) Elementary College Algebra

A course intended for those students who offer only one unit of algebra for entrance. It contains a review of elementary algebra and a more thorough study of such topics as quadratic equations, exponents and radicals, and progressions. No college credit is given for this course, but the successful completion of this course and Mathematics 14 which follows in the second semester, may satisfy the freshman mathematics requirement unless the student's major requires further mathematics.

3 class hours. Credit, 0.

The Department.

1. (I) Introductory Mathematics I

Basic set-theoretic and axiomatic concepts, number systems and equations. A study of elementary functions, algebraically and by the methods of analytic geometry.

3 class hours. Credit, 3.

The Department.

2. (II) Introductory Mathematics II

A terminal course intended for students whose curriculum calls for just one year of mathematics. A continuation of Mathematics 1, including topics from the calculus, statistics, and mathematics of finance.

3 class hours. Credit, 3.

The Department.

Prerequisites, Mathematics 1.

4. (II) Introductory Mathematics IV

A continuation of Mathematics 1 for those students intending to take further courses in mathematics. Analytic geometry and trigonometry.

3 class hours. Credit, 3.

The Department.

Prerequisite, Mathematics 1.

5. (I) Introductory Engineering Mathematics

Trigonometry and algebra: a rapid basic review, theory of equations, simple determinants and the slide rule. Plane analytic geometry: the straight line, conic sections, selected higher plane curves, polar coordinates and parametric equations.

4 class hours. Credit, 4.

The Department.

6. (II) Introductory Calculus for Engineering

Differentiation, with applications, techniques of integration.

4 class hours. Credit, 4.

Prerequisite, Mathematics 5. The Department.

7. (I) Algebra and Trigonometry

For freshmen, except majors in Engineering, who are required to take a full year of college mathematics. Fractions, quadratic equations, exponents, logarithms, variation, determinants of the second and third orders, and plane trigonometry.

3 class hours. Credit, 3.

THE DEPARTMENT.

8. (II) Algebra

This course is designed for freshmen who do not plan to proceed to Calculus. Theory of equations, progressions, mensuration, number systems, and the elements of statistics and mathematics of investments.

3 class hours. Credit, 3.

THE DEPARTMENT.

10. (II) Algebra and Analytic Geometry

This course is designed for freshmen who plan to take Calculus. Theory of equations, binominal theorem, determinants of higher order, and plane analytic geometry.

3 class hours. Credit, 3.

THE DEPARTMENT.

12. (II) Functional Mathematics

For freshmen who are not required to take a full year of college mathematics. Fractions, percentage, linear and quadratic equations with applications, exponents, logarithms, slide rule, proportion, graphs, statistics, progressions. and the elements of mathematics of investments.

3 class hours. Credit, 3.

THE DEPARTMENT.

14. (II) Trigonometry and Algebra

A study of the essential elements of elementary trigonometry and selected topics in algebra.

3 class hours. Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 01.

29. (I) Differential Calculus

The basic ideas and methods of the differential calculus.

3 class hours. Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 10.

30. (II) Integral Calculus

A continuation of Mathematics 29 into the field of the integral calculus, with special emphasis on application to problems.

3 class hours. Credit, 3.

THE DEPARTMENT.

Prerequisite, Mathematics 29.

31. (I) Applied Calculus for Engineers

Area, volume, length of curve, centroid, moment of inertia, liquid pressure, work, partial differentiation.

4 class hours. Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 6.

32. (II) Applied Calculus for Engineers

Multiple integrals, infinite series, expansion of functions, hyperbolic functions, differential equations.

4 class hours. Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 31.

51. (I) Modern Synthetic Geometry

An extension of the geometry of the triangle and the circle. The course is intended especially for those planning to be high school teachers.

3 class hours. Credit, 3.

MR. ROSE.

Prerequisite, Mathematics 30.

53. (I) 54. (II) Higher Algebra

Permutations, combinations, probability; mathematical induction, matrices, determinants, linear equations and dependence; quadratic forms and elimination theory; the complex number system; polynomial equations; elementary theory of groups, rings and fields.

3 class hours. Credit, 3.

THE DEPARTMENT.

Prerequisites, Mathematics 10.

55. (I) Mathematics of Finance

The mathematical principles of simple and compound interest, annuities, depreciation, valuation of bonds, insurance. The development and applica tions of aids to computation in problems arising from financial transactions.

3 class hours. Credit, 3

MR. BOUTELLE.

Prerequisite, Mathematics 7.

56. (II) Finite Differences and Probability (1956-57)

Given in alternate years.

3 class hours. Credit, 3.

MR. WAGNER.

Prerequisites, Mathematics 30.

60. (II) Spherical Trigonometry and Solid Analytic Geometry (1957-58)

The trigonometry of the sphere with application to terrestrial and celestial problems. This is followed by a study of higher plane curves and the analytic representation of points, lines, and surfaces in space. Given in alternate years.

3 class hours. Credit, 3.

MR. BOUTELLE.

Prerequisite, Mathematics 30.

63. (I) Statistics

The fundamental mathematical principles of statistical analysis. The derivation of the basic formulas used, and the study and discussion of such topics as averages, dispersion, skewness, curve fitting, least squares, linear and curvilinear correlation, probability and its application to statistics.

3 class hours. Credit, 3.

MR. WAGNER.

Prerequisite, Mathematics 30, previously or concurrently.

64. (II) Statistics

A continuation of Mathematics 63, including a study of the joint distribution of two or more random variables; the chi-squared, t-, and F-distributions and their applications; and techniques which do not involve an assumption about the form of the basic distribution.

3 class hours. Credit, 3.

Mr. Wagner.

Prerequisites, Mathematics 63, 91.

66. (II) Introduction to Higher Geometry (1957-58)

A study of various methods employed in the modern treatment of the geometry of points, lines, and conics. Such topics as homogenous point and line coordinates, infinite elements; harmonic division; groups of transformations and their invariants; and the elements of projective and other geometrics, will be considered. Given in alternate years.

3 class hours. Credit, 3.

Mr. Andersen.

Prerequisite, Mathematics 10.

71. (I) Vector Analysis (1957-58)

The algebra and calculus of vectors. Applications to physics and other fields will be considered. Given in alternate years.

3 class hours. Credit, 3.

Mr. Andersen.

Prerequisites: Mathematics 30; Physics 26.

72. (II) History of Mathematics (1956-57)

A study of mathematics as it has developed historically. Topics considered include classical problems and concepts of mathematics and the lives and times of the great mathematicians. This course is recommended especially for prospective high school teachers. Given in alternate years.

3 class hours. Credit, 3.

Mr. Rose.

Prerequisite, Mathematics 30.

74. (II) Theory of Numbers (1957-58)

Euclid's Algorism, Theory of Prime Numbers, Aliquot parts, congruences, further topics in number theory. Given in alternate years.

3 class hours. Credit, 3.

The Department.

Prerequisite, Mathematics 30.

81. (I) Differential Geometry (1957-58)

Theory of the geometry of curves and surfaces in three dimensions. Given in alternate years.

3 class hours. Credit, 3.

The Department.

Prerequisite, Mathematics 30.

83. (I) Computational Methods (1958-59)

Errors and approximations in computation, methods of approximating roots of equations, approximation of functions, empirical curve, fitting, approximate integration, and numerical integration of ordinary differential equations. Given in alternate years.

3 class hours. Credit, 3.

The Department.

Prerequisite, Mathematics 30.

91. (I) Intermediate Calculus

Series, expansion of functions, partial differentation, envelopes, and multiple integrals.

3 class hours. Credit, 3.

The Department.

Prerequisite, Mathematics 30.

92. (II) Differential Equations

3 class hours. Credit, 3.

The Department.

Prerequisite, Mathematics 30.

93. (I) Advanced Calculus

The real number system, sequences, elementary theory of functions of one variable and of several variables, Riemannian integration, line integrals, Green's theorem.

3 class hours. Credit, 3.

The Department.

Prerequisite, Mathematics 91.

94. (II) Advanced Calculus

Double and triple integrals, improper integrals, gamma functions, Beta functions, elliptic functions, calculus of variations, Fourier Series, Laplace Transforms.

3 class hours. Credit, 3.

The Department.

Prerequisite, Mathematics 93.

95. (I) 96. (II) Readings

A reading course in advanced theoretical topics, intended to furnish a student further preparation for graduate work in mathematics. Topics may be chosen from the fields of algebra, analysis, geometry or applied mathematics. Admission by permission of the head of the department.

3 class hours. Credit, 3.

The Department.

MILITARY SCIENCE AND TACTICS

Colonel Tarr, PMST, Lieutenant Colonel Gauthier, Assistant PMST, Major Wilson, Assistant PMST, Captain Hill, Assistant PMST, Captain Davis, Assistant PMST, Captain Wilcox, Assistant PMST.

1. (I) 2. (II)

Theoretical and practical instruction in organization of the Army and ROTC; individual weapons and marksmanship; American military history; and leadership, drill, and the exercise of command.

4 scheduled hours. Credit, 2.

Army Instructors.

25. (I) 26. (II)

Theoretical and practical instruction in American military history; map reading; crew-served weapons and gunnery; radio communications; and leadership, drill, and the exercise of command.

4 scheduled hours. Credit, 2.

ARMY INSTRUCTORS.

51. (I) 52. (II)

Theoretical and practical instruction in command and leadership of small units; Military teaching methods; First Aid; rifle marksmanship; organization of armor; tactics and troop leading; radio communications; automotive maintenance and tank driving; tank gunnery; and leadership, drill, and the exercise of command.

6 scheduled hours. Credit, 3.

ARMY INSTRUCTORS.

75. (I) 76. (II)

Theoretical and practical instruction in military administration; military law and boards; Military teaching methods; psychological warfare; geographical foundations of national power; combat intelligence; radio communications; gunnery; automotive maintenance; supply and evacuation; tactics; tank driving; and leadership, drill and the exercise of command.

6 scheduled hours. Credit, 3.

ARMY INSTRUCTORS.

AIR SCIENCE

COLONEL WHITE, PAS, LIEUTENANT COLONEL EWBANK, ASSISTANT PAS, MAJOR RICKARD, ASSISTANT PAS, CAPTAIN BENTON, ASSISTANT PAS, CAPTAIN JOYCE, ASSISTANT PAS, LIEUTENANT BRIDGES, ASSISTANT PAS, LIEUTENANT KAVANAGH, ASSISTANT PAS.

1. (I) 2. (II)

Theoretical and practical instruction in leadership, drill, and exercise of command, history and development of aviation, fundamentals of global geography, international tensions and security organizations, and instruments of national military security.

4 scheduled hours. Credit,

AIR FORCE INSTRUCTORS.

25. (I) 26. (II)

Theoretical and practical instruction in leadership, drill and exercise of command, careers in the United States Air Force, and elements of aerial warfare, consisting of a study of targets, weapons, aircraft, the air, ocean, bases, and forces.

4 scheduled hours. Credit,

AIR FORCE INSTRUCTORS.

51. (I) 52. (II)

Theoretical and practical instruction in leadership, drill and exercise of command, the air force commander and his staff, problem solving techniques, the communication process and air force correspondence, military law, courts and

boards, air force base functions, and applied air science, consisting of a study of aircraft engineering, navigation, and weather.

6 scheduled hours. Credit, 3.

Air Force Instructors.

75. (I) 76. (II)

Theoretical and practical instruction in leadership, drill and exercise of command, military aspects of world political geography, military aviation, and the evolution of warfare, and leadership and management. Emphasis will be placed on preparation for commissioned service, and career guidance.

6 scheduled hours. Credit, 3.

Air Force Instructors.

MUSIC

Professor Alviani, Assistant Professor Contino, Visiting Professor King.

Applied Music

Private lessons in voice, piano, and other instruments at an approximate cost of $30.00 per semester.

15 1-hour lessons. No credit.

25. (I) 26. (II) Fundamentals of Music

A study of the structure of music to meet the practical needs of the listener, performer, or creator. Sight singing, ear training, and keyboard practice are used to give context to the acquired music theory. All music majors are required to study piano while following this course.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

1:00-3:50 Tu.; 1:00-2:50 Th. The Department.

27. (I) 28. (II) Vocal or Instrumental Music

This course is designed to improve the playing of instruments and/or the use of the singing voice, and to create further appreciation of music by actual performance. Students electing this course should take both Courses 27 and 28. Admission by permission of the instructor.

1 class hour. Credit, 1.

Hour by arrangement. The Department.

29. (I) 30. (II) Advanced Instrumental or Vocal Ensemble

A continuation of Music 27 and 28 for the training of performers in combination for voices or instruments. Solo performance and program planning are discussed and practiced. Students taking Course 29 should also take Course 30.

1 class hour. Credit, 1.

Hour by arrangement. The Department.

51. (I) and (II) Discovering Music

This elementary course is non-technical and is designed primarily for students desiring a general background and knowledge of this art. With learning to listen as its motive, the course deals with the elements of music, forms

in music, music compositions and composers. Excerpts from works most frequently heard and performed will be used as illustrations.

3 class hours. Credit, 3.

The Department.

52. (II) Discovering Music

A continuation of Music 51. Students may register for this course without Music 51 if permission is granted by the instructor.

3 class hours. Credit, 3.

The Department.

55. (I) Organization and Direction of Choral Groups

The aim of this course is to demonstrate the methods of developing school and community choral groups. Techniques and factors of good vocal performance are studied and practiced. The student may conduct choral groups during the semester. Previous musical experience is desirable. Admission by permission of the instructor.

2 class hours. Credit, 2.

Hours by arrangement. The Department.

56. (II) Organization and Direction of Instrumental Groups

Different types of instrumental music, the problems of balancing instrumentation, the functioning of instruments are introduced by the members of the class. Previous musical experience is desirable. Admission by permission of the instructor.

2 class hours. Credit, 2.

Hours by arrangement. The Department.

61. (I) Masterpieces of Music

Selected masterpieces from musical literature are intensively analyzed, and a relationship is drawn between the compositions and the social-cultural periods in the history of music.

3 class hours. Credit, 3.

9:00-9:50 Tu. Th. S. The Department.

Prerequisite, Music 51 or 52 recommended but not required.

62. (I) and (II) Music in the Elementary Grades

Designed for the classroom teacher having little or no formal training in music, this course deals with the principles of musical development with particular emphasis on classroom presentation. Using the class as a laboratory, rote and reading songs are examined and processes of presentation evaluated.

3 class hours. Credit, 3.

9:00-9:50 M. W. F. The Department.

75. (I) 76. (II) Music Theory

The development of skill in the use of music fundamentals. Elementary and advanced harmony are studied and practiced. Techniques of elementary counterpoint are presented to show their relationship to vocal and instrumental music.

2 class hours; 1 2-hour laboratory period. Credit, 3.

10:00-10:50 Tu. Th.; 1:00-2:50 W. The Department.

77. (I) 78. (II) Form and Analysis

An approach to the study of music through observation of its forms, analysis of its rhythms, melodies, and harmonies as used in the vocal and instrumental compositions of various periods in the historical development of music. The theory of conducting is discussed, studied, evaluated, and its techniques practiced.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
10:00-10:50 F.; 10:00-11:50 M. W. The Department.

79. (I) Score Reading and Analysis

Through listening and reading assignments the characteristics of voices and instruments are studied and the results are applied to practical arranging for vocal and instrumental groups of various types, sizes, and combinations.

3 class hours. Credit, 3.
The Department.

80. (II) Score Reading and Composition

A continuation of Music 79. In this course the student is expected to study the methods and materials of original composition. Procedures for processing, printing, publishing, and marketing are examined. Laws and regulations governing performance, publication, personnel, and other related activities are discussed.

3 class hours. Credit, 3.
The Department.

81. (I) Music and History

A comprehensive study of the periods in music history—Renaissance, Baroque, Classic, Romantic, and Modern—so that the student may feel their quality, understand their enthusiasm, recognize their resources and limitations, and identify their habits of thought and style.

3 class hours. Credit, 3.
The Department.

82. (II) Music and Research Methods

Recommended to students interested in bibliography, references, source materials, rental libraries, etc., who expect to work in the field of music or related fields. In addition to compilation, the student will investigate a special area of study and report the findings in written form.

3 class hours. Credit, 3.
The Department.

NURSING

Professor Maher, Associate Professor Gilmore,
Associate Professor MacDonald, Assistant Professor Kelly, Miss DiMaggio.

26. (II) Orientation to Nursing

An introductory course in nursing developed in three units and designed to orient the beginning student in nursing to the scope and responsibilities of professional nursing.

Unit I considers professional trends and relationships. The student is acquainted with the meaning of professional nursing, patterns of basic nursing education and with her privileges and responsibilities as a member of the nursing and health team.

Unit II aims to familiarize the student with basic teaching principles and methods which will be applied and extended throughout the curriculum in a variety of student teaching relationships. Instruction and practice in group work are included.

Unit III, introduces the student to nursing, and provides her with the opportunity to become aware of the health needs of people, to develop interpersonal and technical skills, and to become familiar with the basic principles of nursing care. Experience with patients in selected community agencies is provided.

3 class hours; 2 2-hour laboratory periods. Credit, 4.
Second year. Miss Maher, Miss MacDonald, Miss Gilmore.
Prerequisites, Psychology 56; Sociology 53; Home Economics 41; Zoology 1, 35; Chemistry 33.

27. (Summer) Fundamentals of Nursing

The course introduces the student to the nursing care of the patient in the hospital. Basic pharmocology is included. Emphasis is placed upon the fundamentals of nursing care for all patients and the relationship of the nurse to agencies and personnel providing individual, family and community health services.

12 class hours; 10 clinical practice hours—for 8 weeks. Credit, 9.
Second year. Miss Gilmore and Assistants.
Prerequisite, Nursing 26.

28. (Summer) Social and Historical Foundations of Nursing

A survey course of nursing history from the pre-Christian era to the present. The influence of society upon nursing in the various historical periods is considered in relation to the development of nursing as a profession.

4 class hours—for 8 weeks. Credit, 2.
Second year. Miss Maher.

51. (I) Medical and Surgical Nursing I

A course planned to help the student develop the ability to give nursing care to adult patients with representative health problems cared for in the medical and surgical nursing units. Emphasis is placed on the preventive, therapeutic and rehabilitative aspects of medical and surgical nursing care. Pharmacology, diet therapy, pathology and special therapies are combined within this course in relation to the health problems considered. The special services and the personnel within the hospital and community agencies are utilized to enrich the student's concept of comprehensive patient care. Experience in the medical and surgical units, out-patient service, operating room and diet service is provided.

12 class hours; 12 clinical practice hours—for 24 weeks. Third year. Credit, 16.
Miss Gilmore and Assistants; Medical and Allied Professional Staffs of the Springfield Hospital and Health Agencies.
Prerequisite, Nursing 27.

52A. (II) Nursing of Children I

The student is provided with an opportunity to observe and participate in the care of well children in a nursery school. The student is assisted to understand more fully the child's behavior, to gain further insight into her

own behavior and to consider family and community responsibility for preventing emotional disturbance.

15 class hours—for 2 weeks. Third year. Credit, 2.

Miss DiMaggio and Professional Staffs of Cooperating Agencies.

Prerequisite, Home Economics 70.

52B. (I) Nursing of Children II

The course introduces the student to the health needs of children by means of a developmental approach. Emphasis is placed on the importance of child-parent-nurse relationships in the care of the child in health and illness.

By studying the needs of children at various stages of development and identifying the needs of the individual child, the student is helped to appreciate her role in helping the child and family to meet the emotional, physical, social and spiritual needs of the hospitalized child.

In the pediatric in-patient and out-patient departments the student is provided with an opportunity to assist in the medical and nursing care given to children. Experience with other community agencies aids in increasing the student's understanding of the community resources which share the responsibility of providing health services for children.

12 class hours; 12 clinical practice hours—for 12 weeks. Credit, 5.

Fourth year. Miss DiMaggio and Professional Staffs of the Springfield Hospital and Health Agencies.

Prerequisite, Nursing 52A.

54. (II) Psychiatric Nursing

Through the presentation and discussion of the dynamics of human behavior, the content of the course is extended to include the fundamentals of psychopathology related to the basic origin of conflict. The specialized abilities and skills of the nurse in providing care to the mentally ill patients are presented in order that the understanding of the patient's behavior will lead to a constructive nurse-patient relationship thereby enabling the students to participate more fully in the therapeutic plan. The relationship of selected patient's behavior pathology to early manifestations of behavior deviation, early diagnosis, treatment, rehabilitation and prevention will be discussed in case conferences. Community responsibility, resources and planning in regard to this major health problem will be explored. Experience in the care of selected patients in a psychiatric hospital is provided.

12 class hours; 12 clinical hours—for 12 weeks. Third year. Credit, 6.

Miss Kelly; Psychiatric and Allied Professional Staffs of the Cooperating Hospitals and Agencies.

Prerequisite, Nursing 51.

56. (II) Tuberculosis Nursing

The principles and practice of nursing the patient with tuberculosis will be utilized as a basis for extending the student's knowledge of tuberculosis; its significance as a major health problem, the special needs of patients with long-term illnesses and the epidemological aspects of communicable diseases. Clinical

experience in the care of selected patients with tuberculosis will be combined with clinics, conferences, and group discussion.

12 class hours; 12 clinical practice hours—for 6 weeks. Fourth year. Credit, 3.

Lecturer in Tuberculosis Nursing; Medical and Allied Professional Staffs of the Veterans Administration Hospital, Rutland Height, and Health Agencies.

Prerequisite, Nursing 51.

57. (Summer) Maternity Nursing

The course content is developed around the meaning of pregnancy to the patient and the family with special emphasis on the understanding of the mother's physiological and psychological needs before, during, and after the birth of the infant. The specialized abilities of the nurse are taught in relation to an understanding of the phenomena of pregnancy, the birth process, immediate care of the mother and infant, newborn care, the importance for early constructive mother-child relationship and patient teaching. Clinical experience in the prenatal clinic, labor and birth room, newborn and premature nurseries, post-partal units and clinics provided.

12 class hours; 12 clinical practice hours for 12 weeks. Third year. Credit, 5.

Instructor in Maternity Nursing and Pediatric Nursing; Obstetrical, Pediatric, and Allied Professional Staffs of the Wesson Maternity Hospital and Health Agencies.

Prerequisite, Nursing 52A.

58. (II) Public Health Nursing

An introductory course in public health nursing developed and designed to acquaint the student with the scope of public health nursing practice and the organization structure of the various health services within which the public health nurse functions.

In Unit I, national, state and community health services are studied in relation to their structure and functions and to the health needs of the individual and families.

Unit II focuses upon the scope and underlying principles of public health nursing practice. The role of the public health nurse in a family centered health service is emphasized. Field instruction is provided in official and non-official public health services.

6 class hours—for 8 weeks. Fourth year. Credit, 3.

Miss Maher, Professional Staffs of the Springfield Visiting Nurse Association and Springfield Health Department.

Prerequisites, Nursing 51, 52A, 52B, 54, 57.

60. (II) Medical and Surgical Nursing II

This course, a continuation of Medical and Surgical Nursing I, provides the student with an opportunity to give nursing care to patients with special health problems requiring greater knowledge and skill. The student takes a

more active part in planning nursing care and in individual and group teaching of patients. Clinical practice is provided in special medical and surgical services.

8 class hours, 16 hours of clinical practice for 15 weeks. Fourth year. Credit, 8.
Miss Gilmore and Assistants; Medical and Allied Professional Staffs of the Springfield Hospital and Health Agencies.

Prerequisites, Nursing 51, 54.

65. (I) Senior Internship

A sixteen-week internship offering advanced instruction and practice in an elected clinical nursing specialty. Selected cooperating health agencies are utilized.

16 weeks. Fifth year. Credit, 4.
The Nursing Division and Cooperating Agencies.

66. (II) Senior Nursing Seminar

The course aims to give the student increased understanding to the opportunities, privileges and responsibilities facing the professional nurse in modern society and of the functions of organized professional nursing groups.

Nursing problems are studied through an individual and group approach and an opportunity is afforded the student to apply the principles of methodology and educational research in the study of a specific nursing problem.

4 class hours. Fifth year. Credit, 4.
The Nursing Division and Consultants.

70. (Summer) Management of the Hospital Nursing Unit

The principles of scientific management are applied to management of patient care in the hospital nursing unit. Directed experience as a team leader in the hospital nursing unit is provided over an eight-week period.

4 class hours, 20 hours of clinical practice—for 8 weeks. Fourth year.
Credit. 2,
Miss Gilmore and Assistants; Medical and Allied Professional Staffs of the Cooperating Hospitals and Agencies.

OLERICULTURE

Professor Snyder, Assistant Professor Tuttle, Mr. Maynard.

25. (I) Basic Olericulture

A detailed study of the relationship of water, temperature, humidity, light and other basic factors of the environment to the culture of vegetables and other closely related horticultural crops.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Maynard.

51. (I) Nutrition of Vegetable Crops

A critical study of the nutrient requirements of vegetable plants involving soils and their preparation, manures, fertilizers, lime, green manures and crop residues as they relate to intensive cultural practices.

3 class hours. Credit, 3.
Mr. Tuttle.

52. (II) Commercial Vegetable Production

This course deals with the commercial production of the more important vegetable crops grown out-of-doors and under glass, including the principles basic to vegetable farm organization and management, plant growing, varieties, soil management, cultivation, weed control, irrigation, and other special cultural practices. Trips to nearby farms will be required.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Thomson, Mr. Maynard.

73. (I) Produce Marketing Practices

Consideration will be given to the various techniques and methods of preparing produce for market, including harvesting; post harvest handling—washing, waxing, precooling; the use of various gases and growth regulators; packing house facilities and short time storage requirements. Major attention will be given to commercial grades, packs and packages and the various types of produce inspection services.

3 class hours. Credit, 3.
10:00-10:50 M. W. F. Mr. Snyder.

74. (II) Merchandising of Perishables

Discussions will include the various techniques, practices and methods used in merchandising horticultural commodities through both wholesale and retail channels. Major emphasis is placed on pre-packaging, promotion and advertising, brands and their use, federal and state regulations, wholesale outlets and operators, methods of sale, retail outlets and selling, roadside and farm markets and transportation.

3 class hours. Credit, 3.
10:00-10:50 M. W. F. Mr. Snyder.

75. (I) Systematic Olericulture (1957-58)

A detailed study of vegetable crops as to their history, nomenclature, classification, structure and identification. Given in alternate years.

2 class hours; 4 laboratory hours. Credit, 4.
Hours by arrangement. Mr. Snyder.

80. (II) Special Problems

An advanced study of specific problems relative to the production and marketing of vegetable crops, including a review of basic research reports and current literature.

1 class hour; 4 laboratory hours. Credit, 3.
Hours by arrangement. The Department.

PHILOSOPHY

Professor Shute, Assistant Professor Rogers, Mr. Ehrlich.

25. (I) and (II) Introduction to Philosophy

A study of the distinctive role of philosophy in its relations to the insights of science, religion, and art. The student is introduced to some of the general questions, ideas, theories, and methods of inquiry which have given direction

to Western thought, and encouraged to clarify and examine his own ideas regarding knowledge, reality, and value.

3 class hours. Credit, 3.

The Department.

63. (I) and (II) Logic

A study of the principles, problems and methods of critical thinking, emphasis upon principles and methods of formal logic; critical study of inductive reasoning and scientific method with applications to current problems.

3 class hours. Credit, 3.

Mr. Rogers, Mr. Ehrlich.

64. (I) and (II) Ethics

An examination of the many causes and contexts of personal decision and policy formation; an analysis of classical and contemporary theories which attempt to provide an intellectual framework for the guidance and justification of ways of life; and class exploration of concrete cases which focus attention on the realms of value and the place of theory in reflective choice.

3 class hours. Credit, 3.

The Department.

65. (I) History of Philosophy—Ancient and Medieval

A survey of development of western thought with emphasis on the cultural factors which generated and interacted with the successive philosophical interpretations of man's experience.

3 class hours. Credit, 3.

Mr. Rogers.

66. (II) History of Philosophy—Modern

Attention is centered on the impact of modern science on the development of man's comprehensive understanding of the world, of the powers and limitations of knowledge, and of the basis of his valuations.

3 class hours. Credit, 3.

Mr. Rogers.

72. (II) Philosophy of Science

A study of the backgrounds, presuppositions, methods and general theories of modern physical, biological and social sciences. Readings selected from the works of leading scientists and philosophers will be used as the basis of class discussions which will attempt to explore the great achievements of our time and to assess their importance in the student's construction of a mature philosophic orientation.

3 class hours. Credit, 3.

Mr. Rogers.

74. (II) Oriental Philosophies

A study of the present conflict in ideologies within and between the leading cultures of Asia, understood in the light of their philosophical history. The bearing of philosophical differences between East and West on the problem of mutual understanding.

3 class hours. Credit, 3.

Mr. Shute.

81. (I) Philosophy of Religion

A survey of the contrasting types of religious philosophy in the contemporary western world and Asia, with a critical and constructive study of basic issues, such as the meaning of knowledge in the field of religion, the nature of faith, and the religious interpretation of reality.

3 class hours. Credit, 3.

Mr. Shute.

82. (II) Aesthetics

A study of the leading modern theories of the nature of art, the analysis of aesthetic experience, the distinctive function of art in culture and personality, and the principles of criticism.

3 class hours. Credit, 3.

Mr. Shute.

83. (I) Readings in Ancient Philosophy

Selections are read from Plato's *Dialogues* and from the works of Aristotle. A study is made of the leading philosophical issues discussed by these writers, with emphasis on ideas which became basic in the development of western thought.

3 class hours. Credit, 3.

Mr. Shute.

84. (II) Readings in Modern Philosophy

Selections are read from Locke, Hume, Kant, and Whitehead, to display the leading ways in which modern thinkers have looked upon the nature of the universe and the possibilities and limitations of knowledge.

3 class hours. Credit, 3.

Mr. Ehrlich.

85. (I) Metaphysics

The field of metaphysics defined in distinction from the field of science, contrasting theories of reality offered by contemporary naturalism and idealism, especially in the light of recent developments in biological and physical science; analysis of basic ideas which will enable the student to continue a fruitful development of his own philosophy.

3 class hours. Credit, 3.

Mr. Shute.

86. (II) Theory of Knowledge

Types of knowledge and correlated methods of knowing; questions of certainty, probability, and limits of knowledge; ways of expression, such as mathematical formulae, language, and art, and their involvement in the knowing process; the nature of the relation between the knowing subject and the known object.

3 class hours. Credit, 3.

Mr. Ehrlich.

PHYSICAL EDUCATION FOR MEN

Professor Kauffman, Associate Professor Briggs, Associate Professor Rogers, Associate Professor Footrick, Assistant Professor Ricci, Assistant Professor Salwak, Assistant Professor Bosco, Assistant Professor Garber, Assistant Professor Kosakowski, Mr. Douglas.

ACTIVITY COURSES

3. (I) 4. (II) Physical Education

The object of the course is to help every student, through regularity and continuity of physical activity, to realize not only his physical and mental capacities, but learn to use them as an intelligent, cooperative, and efficient citizen. The students are given motor ability tests, expected to learn to swim and to meet minimum standards in the basic skills through participation in team sports and exercise.

3 class hours. Credit, 1.

The Department.

33. (I) 34. (II) Physical Education

A continuation of Physical Education 3 and 4.

3 class hours. Credit, 1.

The Department.

SKILLS AND TECHNIQUES IN PHYSICAL EDUCATION

The following courses are concerned with the methods and techniques of applied physical education. Classroom presentation, field, court, and floor demonstrations are emphasized. These courses are primarily for students enrolled for a Bachelor of Science degree with a major in physical education. Non-major admission only by permission of the instructor.

5. (I) Skills and Techniques

Development of fundamental skills and methods of teaching and organizing groups for participation in lacrosse and basketball.

60 clock hours per semester. Credit, 1.

Mr. Garber, Mr. Curran.

6. (II) Skills and Techniques

Fundamental skills and instruction in techniques of teaching elementary apparatus, tumbling exercises, pyramids, construction of elementary gymnastic routines.

60 clock hours per semester. Credit, 1.

Mr. Bosco.

35. (I) Skills and Techniques

Development of fundamental skills, methods of teaching and organizing groups for participation in soccer, and wrestling.

60 clock hours per semester. Credit, 1.

Mr. Briggs, Mr. Douglas.

36. (II) Skills and Techniques

Fundamental skills in life-saving and water-safety methods. Successful completion resulting in qualifications as American Red Cross Water Safety Instructor.

60 clock hours per semester. Credit, 1.

Mr. Rogers.

63. (I) Skills and Techniques

Fundamental skills and techniques of teaching track and field and badminton.

60 clock hours per semester. Credit, 1.

Mr. Footrick, Mr. Ricci.

64. (II) Skills and Techniques

Instruction and participation in indoor and outdoor games of high and low organization. Instruction in skills in archery and participation in various types of competitive events.

60 clock hours per semester. Credit, 1.

Mr. Briggs, Mr. Douglas.

83. (I) Skills and Techniques

Fundamental skills, instruction in techniques of teaching tennis and rhythmics.

60 clock hours per semester. Credit, 1.

Mr. Kosakowski, Mr. Bosco.

84. (II) Skills and Techniques

Fundamental skills and techniques of teaching volleyball and golf.

60 clock hours per semester. Credit, 1.

Mr. Ricci, Mr. Garber.

MAJOR COURSES

21. (I) Introduction to Physical Education

Origins of physical education, fundamental concepts, current status in education, qualifications and professional opportunities in the field.

3 class hours. Credit, 3.

Mr. Kaufmann.

22. (II) First Aid and Safety

Materials applicable to the immediate care of the injured, causes of accidents and procedures designed to develop habits and attitudes leading to safe behaviour through desirable safety practices. Certified by American Red Cross for First Aid Instructor training.

3 class hours. Credit, 3.

Mr. Briggs.

23. (I) Principles and Practices in Health Education

Principles of maintaining and improving individual health, pupil needs, fundamentals related to planning instruction on the elementary and secondary school level, resources in health education, evaluation of materials.

3 class hours. Credit, 3.

Mr. Salwak.

41. (I) Human Anatomy

A study of the gross structure and function of the human body.

3 class hours. Credit, 3.

Mr. Ricci.

42. (II) Kinesiology

A course aimed to give the anatomical application basic to a thorough understanding of the mechanical problems in motor skills.

3 class hours. Credit, 3.

Prequisite, Physical Education 41. Mr. Bosco.

53. (I) Physical Education in Elementary Schools

Aims and objectives of modern materials and methods of teaching group games, rhythmic activities, dance relays, stunts and lead-up games for the elementary school.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Footrick.

54. (II) Physical Education in Secondary Schools

A course in modern methods of teaching physical education in secondary schools. Includes objectives, content material, and organization procedures at the secondary level.

3 class hours. Credit, 3.

Mr. Ricci.

55. (I) Organization and Administration of Physical Education

Problems and procedures in physical education, organization of programs, class schedules, classification of students, equipment, records, finance, intramurals, construction and maintenance of gymnasia, swimming pools, locker rooms, and outdoor play areas.

3 class hours. Credit, 3.

Mr. Kauffman.

57. (I) Methods and Materials: Coaching Baseball, Gymnastics

Designed to develop individual skills and techniques of teaching and coaching baseball and gymnastics.

1 class hour; 1 2-hour laboratory period. Credit, 2.

Mr. Lorden, Mr. Bosco.

58. (II) Methods and Materials: Coaching Track, Football

Designed to develop individual skills and techniques of teaching and coaching track and football.

1 class hour; 1 2-hour laboratory period. Credit, 2.

Mr. Footrick, Mr. O'Rourke.

59. (I) Adaptive Physical Education

A program of developmental activities, games, sports, and rhythms suited to the interests, capacities and limitations of students with disabilities who may not safely engage in unrestricted participation in the vigorous activities of the general physical education program.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Prerequisite, Physical Education 42. Mr. Garber.

71. (I) 72. (II) Special Problems Course

Presentation and discussion of research work in physical education, health, or athletics.

3 class hours. Credit. 3.

The Department.

74. (II) Tests and Measurements

This course considers the status of measurements in physical education, an historical sketch, typical of contributions in anthropometrics, strength tests, ability and achievement tests, cardiac functional tests, neuro-muscular control tests, and sports technique tests; and it includes the tools of measurement, indices, and the theory and practice of test administration.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Salwak.

75. (I) Athletic Injuries—Prevention and Care

The use of proper personal and field equipment, support methods, conditioning exercises, the medical examination, therapeutic aids, and the clinical use of physiotherapy equipment.

2 class hours. Credit, 2.
Prerequisite, Physical Education 42. Mr. Ricci.

76. (II) Philosophy and Principles of Physical Education

Contemporary interpretations and critical analysis. The compilation and organization of material in a functional relationship for the foundation of policies and program construction.

3 class hours. Credit, 3.
Mr. Garber.

78. (II) Physiology of Exercise

Application of basic physiological concepts to the program of physical education, emphasis upon the physiological effects and adjustments accruing from participation in physical activity. Major factors in diet, conditioning, fatigue, and physical fitness are considered.

3 class hours. Credit, 3.
Mr. Bosco.

Prerequisite, Physical Education 42.

80. (I) and (II) Driver Education Instructor Course

This course includes driver education and driver training at the instructor's level, and is designed to orient the student to live safely through skillful and efficient behavior on streets and highways. Leads to certification as instructor in driver education and driver training.

2 class hours. Credit, 2.
Mr. Briggs.

82. (II) Methods and Materials: Coaching Soccer, Basketball

Designed to develop individual skills and techniques of teaching and coaching soccer and basketball.

1 class hour; 1 2-hour laboratory period. Credit, 2.
Mr. Briggs, Mr. Curran.

PHYSICAL EDUCATION FOR WOMEN

Professor Totman, Assistant Professor Hubbard Assistant Professor Riggs, Miss Ogilvie, Miss Reid, Miss Wallace.

7. (I) 8. (II) Physical Education

Students are required to participate in one term of dancing, in one team sport, and to pass a safety test in swimming. Except for these requirements, all unrestricted students may select any activity which is offered. Fall season: field hockey, volleyball, soccer, archery, tennis, swimming. Winter season: basketball, volleyball, badminton, swimming, life saving (by permission), modern dance, square dance, calisthenics, posture training. Spring season: softball, soccer, archery, swimming, modern dance.

3 class hours. Credit, 2.
The Department.

27. (I) 28. (II) Physical Education

The activities offered in Courses 7 and 8 are continued. In addition, advanced modern dance is offered in the fall season and water safety instruction in the winter season. Unrestricted students may select any activity which is offered.

3 class hours. Credit, 2.

THE DEPARTMENT.

63. (I) 64. (II) Teaching Sports for Secondary Schools

Designed to give the fundamentals of teaching and officiating of team sports for women appropriate for the secondary school level. Course content includes development and knowledge of techniques, knowledge of rules, teaching progressions, class procedures, and instruction in officiating related to the following activities: hockey, soccer, speedball, volleyball, basketball, and softball.

1 class hour; 3 laboratory hours. Credit, 2.

MISS RIGGS.

65. (I) Play Activities and Games for Elementary Schools

A study of the place of physical education in the schools with emphasis on procedures, organization and teaching techniques. There will be more opportunity to learn games and other play activities for children from 5 to 14 years.

1 class hour; 3 laboratory hours. Credit, 2.

MISS TOTMAN.

66. (II) Rhythms and Dancing for the Elementary School

The course will include the development of rhythmic sense through basic motor skills; dramatizations; the construction of simple dance forms; folk dances and singing games. There will be practice in planning the rhythm and dance program in the elementary school from nursery school through sixth grade.

1 class hour; 3 laboratory hours. Credit, 2.

MISS HUBBARD.

68. (II) Water Safety Instructor Course

This course includes a review of the techniques of senior life saving and gives training in the Red Cross Water Safety Course. A detailed study is made of the organization and teaching of all levels of swimming and diving in various situations. Especial emphasis is given to safety practices. Successful completion results in certification as American National Red Cross Safety instructors.

2 scheduled periods. Credit, 2.

MISS WALLACE.

PHYSICS

PROFESSOR POWERS, PROFESSOR ALDERMAN, PROFESSOR ROSS, ASSISTANT PROFESSOR MATHIESON, ASSISTANT PROFESSOR FISHER, MR. CROOKER, MR. CARSON, MR. OLIVER, VISITING LECTURER CLANCY.

25. (I) Mechanics, Sound, and Heat

This course is largely a study of the following and related topics; equilibrium of bodies; forms of energy; motion, fluids; surface tension; molecular phenomena; elasticity; wave-motion; sound; thermometry; expansion; hygrometry; transmission of heat; changes of radiation.

3 class hours; 1 2-hour laboratory period. Credit, 4.

THE DEPARTMENT.

Prerequisite, Mathematics 5, 7, or 14.

26. (II) Light and Electricity

Includes wave-theory of light; optical instruments; analysis of light; interference; polarization; magnetism; electrostatics; production and properties of electric currents; electrical appliances and machines; oscillatory circuits; vacuum tubes, and related topics.

3 class hours; 1 2-hour laboratory period. Credit, 4.

THE DEPARTMENT.

Prerequisite, Physics 25.

27. (I) General Physics

The topics covered are mechanics, sound, and heat with special emphasis on the mathematical development of statics, centroids, and Gauss' theorem.

3 class hours; 1 2-hour laboratory period. Credit, 4.

THE DEPARTMENT.

Prerequisites, Mathematics 5, 6, or equivalent; Mathematics 31 previously or concurrently.

28. (II) General Physics

The topics covered are light and electricity with special emphasis on the mathematical development of Gauss' theorem, dielectrics and A.C. electricity.

3 class hours; 1 2-hour laboratory period. Credit, 4.

THE DEPARTMENT.

Prerequisites, Physics 27.

51. (I) 52. (II) Magnetism, Electricity, Photo-electricity, Thermionics and Applications

Course 51 deals with direct currents (mesh currents often used); Course 52 with alternating currents (low and high frequency), application of thermionics, and photo-electricity. These courses are planned to give the student a good training in the theory and methods of measurement in the indicated and allied subjects. Modern methods are stressed and instruments of precision are used.

2 class hours; 1 2-hour laboratory period. Credit, 3.

8:00-8:50 Tu. Th.; 10:00-11:50 Tu. or 1:00-2:50 W. or Th. MR. POWERS.

Prerequisites, Physics 26 and Mathematics 29 for Course 51; Physics 51 for Course 52.

54. (II) Meteorology

The course deals with the application of certain concepts of mechanics and thermodynamics to the consideration of various atmospheric phenomena such as condensation, pressure, radiation, motion, fronts, etc. The treatment is theoretical in nature but the observed phenomena are correlated to the theory with a descriptive approach. The laboratory deals with weather observations, preparation of weather charts, and the techniques of weather forecasting.

2 class hours; 1 2-hour laboratory period. Credit, 3.

2:00-2:50 Tu. Th.; laboratory hours by arrangement. MR. CROOKER.

Prerequisites, Physics 26; Mathematics 30.

55. (I) 56. (II) Mechanics

Development of the fundamental concepts of dynamics with applications to particles and rigid bodies in translation and rotation. One laboratory period may be substituted for one class hour.

3 class hours. Credit, 3.
9:00-9:50 Tu. Th.; laboratory by arrangement. Mr. Ross.
Prerequisites, Physics 26; Mathematics 30.

57. (I) Introduction to Astronomy

The general facts and principles of astronomy, mainly qualitative, starting with basic physical principles. Periods of evening observation will be substituted for lecture hours when feasible. This course may not be taken for major credit in Physics.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. Ross.
Prerequisite, Mathematics 7 or equivalent.

58. (II) Photography

Class work and laboratory practice in the fundamentals of photography. Types of cameras, characteristics of photographic emulsions, exposure and exposure meters, processing of negatives and prints, enlarging, composition, photomicrography. Limited to ten students. This course may not be taken for major credit in Physics.

2 class hours; 1 4-hour laboratory period. Credit, 3.
3:00-3:50 M. W.; 1:00-5:00 F. Mr. Powers.
Prerequisites, Physics 25, 26; Chemistry 1, 2; Mathematics 10.

60. (II) Sound and Acoustics

A study of vibrations, vibrating bodies, coupled systems, sound structure, and acoustic properties. The work will include many applications of sound to technical and commercial fields.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Alderman.
Prerequisites, Physics 55 or its equivalent.

61. (I) 62. Heat and Thermodynamics

A study of heat exchanges and energy changes due to heat in systems of matter. The subject material and experimental methods are useful in other branches of science.

2 class hours; 1 2-hour laboratory period. Credit, 3.
10:00-10:50 Tu., Th.; laboratory by arrangement. Mr. Alderman.

Prerequisites, Physics 26; Mathematics 30.

63. (I) 64. (II) Optics

An intermediate course in the theory of light. Work in geometrical and physical optics is done. Precision instruments are used in the laboratory.

2 class hours; 1 2-hour laboratory period. Credit, 3.
1:00-1:50 Tu., Th.; laboratory hours by arrangement. Mr. Alderman.

Prerequisites, Physics 26; Mathematics 29.

75. (I) 76. (II) Advanced Experimental Work in Selected Topics

These courses are largely experimental and the subject matter is adapted to the needs of the individual student. The research viewpoint is emphasized. The class hour is used for a course in precision of measurements.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
THE DEPARTMENT.

Prerequisites, Mathematics 29, 30; two of the following year courses: Physics 51-52, 55-56, 61-62, 53-64.

85. (I) 86. (II) Modern Physics

Typical subjects studied are theories of the atom, radiation, quantum theory; spectra, X-ray analysis, nuclear reactions.

3 class hours. Credit. 3.
9:00-9:50 M. W. F. THE DEPARTMENT.

Prerequisites, Physics 52, 64, and 12 other junior-senior physics credits; Mathematics 30.

95. (I) 96. (II) Electronics

2 class hours; 1 2-hour laboratory period. Credit, 3.
10:00-10:50 M. F.; 10:00-11:50 W. THE DEPARTMENT.
Prerequisites, Physics 51, 52; Mathematics 29, 30.

POMOLOGY

PROFESSOR FRENCH, ASSOCIATE PROFESSOR ROBERTS, MR. J. F. ANDERSON

25. (I) Introductory Pomology

This course deals with modern tree fruit production including varieties, orchard sites and soils, planting systems, soil management, fertilizers, bearing habits, pruning, pollination, thinning, pest control and handling the crop. The content of this course should be of value to students majoring in allied fields.

2 class hours; 1 2-hour laboratory period. Credit, 3.
MR. ANDERSON.

26. (II) Small Fruits

A study of the growing of raspberries, blackberries, strawberries, currants, blueberries, cranberries, and grapes, dealing with such questions as varieties, selecting a site for the plantation, soils, fertilizers, pruning, harvesting, and marketing.

2 class hours; 1 2-hour laboratory period. Credit, 3.
10:00-10:50 M. F.; 1:00-2:50 W. or F. MR. ANDERSON.

56. (II) Orchard Pest Control

This course is especially designed to familiarize the student with: (a) spraying and dusting machinery; (b) methods in the application of materials used in orchards, with the important considerations for spraying each fruit and for combating each orchard pest; (c) preparation for use of the common fungicides and insecticides.

2 class hours; 1 2-hour laboratory period. Credit, 3.
8:00-8:50 Tu., Th.; 1:00-2:50 Tu. MR. ROBERTS.

75. (I) Systematic Pomology (1958-59)

A study of the more important kinds and varieties of fruits grown in the United States, their relationships and nomenclature. Particular emphasis is placed upon the identification, classification and value of varieties including a study of the characters of the plant as well as the fruit. Given in alternate years.

1 class hour; 3 2-hour laboratory periods. Credit, 4.
8:00-8:50 Tu.; 1:00-2:50 M. W. F. Mr. Anderson.

77. (I) Fruit Marketing (1957-58)

This course consists of a critical study of the handling of fruit from tree to consumer, including such phases as the physiology of fruit as related to harvesting procedure, also fruit grades and grading, packing, storing and merchandising. Given in alternate years.

2 class hours; 1 2-hour laboratory period. Credit, 3.
Mr. Roberts.

79. (I) Advanced Pomology (1958-59)

Special attention is given to more important findings of research dealing with the interrelation of stock and scion, temperature influences, water relationships and the mineral nutrition of fruit plants. The geography of world fruit production is also considered. Given in alternate years.

2 class hours; 1 2-hour laboratory period. Credit, 3.
The Department.

Prerequisite, Pomology 25 or equivalent.

81. (I) Advanced Pomology (1957-58)

A critical study of the more important research dealing with pollination, fruit set and thinning, preharvest drop, biennial bearing, and the physiology of fruit during storage. The location and objectives of fruit breeding programs in the United States are also discussed. Given in alternate years.

2 class hours; 1 2-hour laboratory period. Credit, 3.
The Department.

Prerequisite, Pomology 25 or equivalent.

84. (II) Special Problems in Pomology

Each student will investigate an individual problem pertinent to his future objectives.

1 class hour; 4 laboratory hours. Credit, 3.
The Department.

Prerequisites, Pomology 79 and 81.

85. (I) 86. (II) Cranberry Problems

For seniors specializing in cranberry technology. Selected readings and individual work to familiarize students with the literature, research, and problems of the cranberry industry.

Hours by arrangement. Credit, 2.
Mr. French.

PLANT BREEDING

52. (II) Plant Breeding Methods

An advanced study of genetic topics peculiar to plants, also the methods and problems of the plant breeder. Laboratory work in genetic analysis and the breeding of plants.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 M. F.; 3:00-4:50 W. Mr. French.
Prerequisite, Zoology 53.

81. (I) 82. (II) Special Problems in Plant Breeding

Qualified seniors may carry on advanced study on special topics or undertake such original investigation as time and available material will permit.

Hours by arrangement. Credit, 2.
Mr. French.
Prerequisite, Plant Breeding 52.

POULTRY HUSBANDRY

Professor Fox, Professor Sanctuary, Associate Professor Vondell, Associate Professor Smyth, Assistant Professor Banta, Assistant Professor Houch, Assistant Professor Anderson.

25. (I) General Poultry

For students not majoring in poultry husbandry. A general course giving an introduction to the breeds of poultry, the principles and practice of breeding, incubation, and poultry nutrition, brooding and rearing, houses and equipment, management practices, disease control, marketing poultry products, and the business of poultry keeping.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 M. F.; 10:00-11:50 or 3:00-4:50 T. Mr. Fox, Mr. Vondell.

52. (II) Incubation and Brooding

This course is based upon the actual operation of incubators and brooders. Each year a research project is planned and data obtained concerning the effects of various incubator adjustments upon malpositions and maldevelopment of embryos and the percentage of hatch. Studies of temperature gradients, chick behavior and development are made in brooding with various types of equipment. Analysis is made of common and unusual field problems.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
11:00-11:50 W.; 3:00-4:50 M.; other hours by arrangements.
Mr. Sanctuary.

53. (I) Poultry Judging

Physiological and anatomical characters are used in production judging. The American Standard of Perfection is employed in a study of the more popular breeds and varieties, and for exhibition judging. Judging teams competing in the Eastern Intercollegiate Contest are trained in this course.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
8:00-8:50 Tu.; 1:00-2:50 Th. F. Mr. Banta.

55. (I) Poultry Housing and Sanitation

In this course are considered the biological factors related to the proper physical environment necessary for growth, health, and reproduction. Various

systems of ventilation and methods of insulation are studied and demonstrated by models. Humidity, temperature, and condensation studies are made at the poultry plant with varying adjustments of ventilation devices. A study is made of modern equipment. Sanitation from the standpoint of disease prevention practices is also considered.

1 class hour; 1 2-hour laboratory period. Credit, 2.
9:00-9:50 Th.; 1:00-2:50 Tu. Mr. Sanctuary.

56. (II) Poultry Nutrition

A study of the scientific principles of nutrition, classification and identification of feedstuffs, formulation and calculation of rations for specific purposes. A class trip may be arranged.

2 class hours; 1 2-hour laboratory period. Credit, 3.
9:00-9:50 Tu. Th.; 1:00-2:50 W. Mr. Anderson.

75. (I) Marketing Poultry Products

A study of the preparation and grading methods of eggs and poultry products to meet the requirements of the northeastern markets. The laboratories are designed to cover the fields of modern dressing, processing and packaging of poultry; as well as grading, candling and quality studies of eggs. A one-half day class trip to Springfield markets in December is required. Estimated cost, two dollars.

1 class hour; 1 2-hour laboratory period. Credit, 2.
10:00-10:50 Tu.; 3:00-4:50 W. Mr. Vondell.

76. (II) Turkey Production

This course includes the production of ducks and geese but most of the time is given to the turkey industry; its importance, breeds, breeding, incubation, brooding, feeding, finishing, marketing, etc.

1 class hour; 1 2-hour laboratory period. Credit, 2.
1:00-1:50 M.; 3:00-4:50 W. Mr. Smyth.

77. (I) Poultry Breeding

The improvement of poultry by selection is developed through a study of the principles of heredity. The inheritance of morphological and physiological characters including plumage color, egg production, meat production, hatchability, egg traits, and disease resistance.

2 class hours; 1 2-hour laboratory period. Credit, 3.
11:00-11:50 M. W.; 1:00-2:50 W. Mr. Fox.

78. (II) Seminar and Farm Management

A combination seminar and lecture course designed to give the student a comprehensive view of all phases of the poultry industry. A field trip covering approximately three days will be arranged. Poultry majors with a B average in poultry courses may elect an additional problem credit.

3 class hours; 1 2-hour laboratory period may be elected. Credits, 3, 4.
9:00-9:50 M. W. F. Mr. Houch.

PSYCHOLOGY

PROFESSOR NEET, PROFESSOR FELDMAN, PROFESSOR GOSS, PROFESSOR KATES, ASSOCIATE PROFESSOR FIELD, ASSISTANT PROFESSOR EPSTEIN, ASSISTANT PROFESSOR ERLICK, MR. CLIFFORD, MR. MINTZ, MR. LEWIT, MRS. FIELD, MR. LEVITT, MR. LIFTON, VISITING LECTURER MRS. FIELDER, VISITING LECTURER KLETT, VISITING LECTURER HUDGINS.

26. (I) and (II) General Psychology

This is an introductory course dealing with the principles and applications of psychology with regard to the understanding of behavior. Topics considered include the development of behavior, intelligence and aptitudes, sensory and neural processes, learning, thinking, language, motivation, emotion, personality and the psychology of interpersonal relationships.

3 class hours. Credit, 3.

THE DEPARTMENT.

28. (II) General Psychology

A continuation of Psychology 26. The nature and problems of adjustment are emphasized. Topics considered include frustration and conflict, adjustment mechanisms and behavior deviations.

3 class hours. Credit, 3.

THE DEPARTMENT.

Prerequisite, Psychology 26.

51. (I) Experimental Psychology

This course is designed to give an understanding of the problems, methods, and data of experimental psychology. One of the basic functions of the course is to acquaint the student with the scientific method as applied to psychological studies of behavior.

2 class hours; 1 2-hour laboratory period. Credit, 3.

MR. NEET.

Prerequisite, Psychology 26.

56. (I) and (II) Educational Psychology

A study of psychological facts and principles fundamental to education, teaching, and personal relationships between teacher and pupil. Topics considered in relation to school situations are: physical and mental growth, intelligence, motivation, emotions, learning, transfer of training and mental hygiene of teacher and pupil.

3 class hours. Credit, 3.

MR. MINTZ.

Prerequisite, Psychology 26.

61. (I) Social Psychology

The social behavior of the individual. Topics considered will include methods of studying social behavior, schools of social psychology, social behavior of animals, foundations of personality development, social (cultural) determinants of personality, social attitudes and their measurements, effects of collective situations on individual behavior, custom and conformity.

3 class hours. Credit, 3.

MR. LEWIT.

Prerequisite, Psychology 26.

62. (II) Social Psychology

A survey of multi-individual phenomena. Topics to be considered are methods of studying collective action, leadership, morale, propaganda, nature and measurement of public opinion, behavior in crowd situations, social conflict and prejudice.

3 class hours. Credit, 3.

Mr. Lewit.

Prerequisite, Psychology 26.

63. (I) Physiological Psychology

A study of the relationships between physiological processes and behavior. Major emphasis will be placed upon the structure and mechanisms of the central nervous system and sense organs, endocrine functions, and drives.

3 class hours. Credit, 3.

Mr. Feldman.

Prerequisites, Psychology 26; Zoology 35.

72. (II) Advanced Experimental Psychology

The literature, techniques, and apparatus of experimental psychology are considered, and selected projects are carried out individually by the members of the class.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

Mr. Neet.

Prerequisites: Psychology 51; Zoology 35.

75. (I) Statistics in Psychology

The application of statistical procedures to the analysis of psychological data and to problems of measurement in psychology and related fields.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Klett.

Prerequisites: Psychology 26; Statistics 77 or Mathematics 62.

81. (I) 82. (I) and (II) Psychological Tests

Different varieties of psychological tests are studied. The first semester surveys the field of testing and introduces the student to tests of intelligence, aptitude, interest, personality, and adjustment. The second semester is devoted to a more intensive study of individual intelligence tests with the aim of teaching the student to administer, score and interpret those in most common use. Either semester may be elected independently.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mrs. Fiedler, Mr. Kates.

Prerequisite, Psychology 26.

83. (I) Abnormal Psychology

A study of the etiology, symptoms and therapy of the behavior abnormalities. The following are considered: neuroses, functional and organic psychoses, epilepsies, alcoholism and drug addiction, character disorders, speech disorders and mental deficiency. In discussing the development of the various abnormalities emphasis is placed on the relationship between the dynamics of the normal and the distorted personality. Hospital trips and clinics.

3 class hours. Credit, 3.

Mr. Neet.

Prerequisite, Psychology 26.

86. (I) and (II) Industrial Psychology

A study of psychology principles and methods in business and industrial situations. Topics considered include: job analysis, job evaluation, employee selection and training, fatigue, techniques of motivation, measurement of morale and problems of leadership.

3 class hours. Credit, 3.

Mr. Erlick.

Prerequisite, Psychology 26.

88. (II) Psychology of Guidance

A study of the psychological principles, techniques and tests necessary in guidance. Practice is given in organizing and evaluating relevant data in the analysis of illustrative cases.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Field.

Prerequisites, Psychology 26 and 81 or consent of the instructor.

90. (II) Contemporary Psychologies

A logical, historical, and systematic analysis of contemporary psychological theories, including structuralism, functionalism, Gestalt and organistic psychologies, psychoanalysis, and behaviorisms from Thorndike and Watson to the contemporary scene.

3 class hours. Credit, 3.

Mr. Goss.

Prerequisite, Psychology 26.

92. (II) Clinical Psychology

A study of the techniques and methods involved in the diagnosis and treatment of behavior disorders. Diagnostic clinical testing, counselling, and other psychotherapeutic procedures are given consideration. Hospital trips and clinics.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Epstein.

Prerequisite, Psychology 83 or consent of the instructor.

93. (I) Psychology of Adolescence (1958-59)

A consideration of the development, and emotional, social and intellectual adjustment of the individual during the adolescent years. Given in alternate years.

3 class hours. Credit, 3.

Mr. Clifford.

94. (I) and (II) Child Psychology

This course aims to develop an understanding of the behavior of the child. Psychological aspects of the following topics are considered: original nature, maturation and development of behavior, language, habit formation, emotional behavior, development of intelligence and understanding, social behavior, motivation, personality, and mental hygiene. Nursery school observation and practice.

3 class hours. Credit, 3.

Mr. Clifford.

Prerequisite, Psychology 26.

95. (I) 96. (II) Problems in Psychology

For qualified seniors. The student will be allowed to do independent work and study on special problems or in certain fields of psychological interest. By arrangement with the members of the department.

Credit, 1.
THE DEPARTMENT.

RECREATION LEADERSHIP

ASSOCIATE PROFESSOR RANDALL.

51. (I) Principles of Recreation

This course considers recreation as an important social force in community life. Emphasis is given to the study and discussion of functional recreation and park programs: their history and philosophy, their relationship with various agencies and related fields, their resources, current problems, and established principles. A field trip is required.

3 class hours. Credit, 3.
MR. RANDALL.

52. (II) Group Leadership and Camp Counseling

A study of the organized camp and the counselor's part in it, including characteristics, objectives, organization, program, and operating procedures. Major emphasis is given to group leadership, camper guidance, and the acquisition of camping and program skills. Each student is expected to participate in role-playing, program leadership, committee presentations, and two field trips. One of these trips involves a two-night camping experience and the cooking of five meals out-of-doors. Total cost is less than five dollars.

2 class hours; 1 2-hour laboratory period. Credit, 3.
MR. RANDALL.

74. (II) The Recreation Program

Major emphasis is placed upon a term project in which each student plans a complete and well-rounded recreation program to meet the needs, interests, and abilities of the community which he studied intensively in Sociology 51. Program planning principles and resources are discussed and applied in selected examples. A field trip is required. Students planning to take this course should consult the instructor before the time of pre-registration.

3 class hours. Credit, 3.
MR. RANDALL.

Prerequisites: Recreation Leadership 51; Sociology 51.

77. (I) Organization and Administration of Community Recreation

A study of staff organization; personnel recruitment, training and supervision; legal aspects; planning and maintenance of areas, facilities and equipment; finances, business procedure, and public relations. Attention is given to public and private recreation agencies. A field trip is required.

3 class hours. Credit, 3.
MR. RANDALL.

Prerequisite, Recreation Leadership 74.

79. (I) 80. (II) Recreation Leadership Guidance and Practice

Field experience, involving administrative procedures, in a program leadership capacity in a public or private agency of the student's choice within com-

muting distance of the university. Supervision is shared by the department and a member of the professional staff of the agency.

Admission by permission of the department.

1 class hour; field work as required.

Mr. Randall and Cooperating Agency.

RELIGION

Chaplains Father David J. Power, Rabbi Louis Ruchames, the Reverend Albert L. Seely, and visiting lecturers: the Reverend Thayer A. Greene, the Reverend Ewald Mand, and others.

15. (I) 16. (II) A History of Jewish Thought and Culture

A survey of Jewish thought and culture from the Bible to contemporary times. Particular emphasis will be placed upon the relevance of such thought to contemporary religious and philosophical problems. Among the thinkers to be discussed will be Jeremiah, Ecclesiastes, Philo, Maimonides, Spinoza, Achad-Ha'am, and Will Herberg.

1 hour. No Credit.

Mr. Ruchames.

17. (I) 18. (II) Basic Beliefs and Practices of Judaism

A study of the fundamental principles and practices of Judaism. An examination of the philosophy of Judaism is followed by an analysis of its customs and ceremonies.

1 hour. No Credit.

Mr. Ruchames.

20. (II) Introduction to the Old Testament

An introduction to the history, literature, and religion of the Old Testament. The historical problems of the individual books are studied, their message for their own period examined, and their significance for the Christian faith explored. The aim is to give a clear concept of the beginnings of Hebrew religion and thus to help understand and evaluate the Old Testament as an integral part of the Christian Bible and faith.

1 hour. No Credit.

Mr. Mand.

31. (I) The Life and Message of Jesus

Based primarily on the Synoptic Gospels, the course will interpret the life and ministry of Jesus in the light of his Old Testament heritage and in terms of his unique significance. Being a Christian will be seen from the Biblical viewpoint as commitment to God as known through Jesus Christ.

1 hour. No Credit.

Visiting Lecturer.

41. (I) 42. (II) Catholic Faith and Practice

A seminar with exposition and discussion of questions concerning Roman Catholic dogmas and practices.

1 hour. No Credit.

Fr. Power.

60. (II) Christian Faith and Human Relations

A study of the relevance of Christian theology to the problems of human existence. Making use of the insights of modern depth psychology in personal relations, the course will deal with what it means to be a person and what this implies for the various relationships of life, i.e., friendship, courtship, marriage, relation to parents and to children. Attention will be given to the insights of Christian theology upon the sexual relationship.

1 hour. No Credit.

Mr. Greene.

71. (I) 72. (II) Essentials of Protestant Christianity

A study of the main tenets of Protestant belief and action. The aim is to help the student clarify and strengthen his own convictions through examination of topics such as man's knowledge of God, the person and mission of Jesus Christ, the nature of the Church, and the relation of Christian ethics to personal living and the social order.

1 hour. No Credit.

Mr. Seely.

Courses in Elementary and Intermediate Hebrew, and Elementary Yiddish are offered by Rabbi Ruchames. These are open to all students.

ROMANCE LANGUAGES

Professor Goding, Professor Ferrigno, Associate Professor Clarke, Associate Professor Wexler, Assistant Professor Johnson, Miss Tillona†, Mr. Greenfield, Mr. Fraker, Mr. Mermier†, Mr. MacCombie, Mr. Hull, Miss Landro, Mr. Smith, Miss Cordones, Miss Munoz, Miss DuParquet.

FRENCH

1. (I) 2. (II) Elementary French

For those who have had no previous courses in French. Intensive drill for rapid reading, writing, speaking and understanding. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Provost.

3 class hours; 1 laboratory hour. Credit, 3.

The Department.

5. (I) 6. (II) Intermediate French

Readings from representative works of French literature. Composition, grammar review, intensive oral practice.

3 class hours; 1 laboratory hour. Credit, 3.

The Department.

Prerequisites, French 1 and 2, or two years of high school French.

7. (I) 8. (II) Intermediate French; French Life and Culture

Selected readings from representative French literary works and a thorough review and study of grammar. Composition, intensive oral practice.

3 class hours; 1 laboratory hour. Credit, 3.

The Department.

Prerequisites: 2 or 3 years of high school French and permission of the department.

† On leave of absence.

25. (I) 26. (II) Introduction to French Literature

A study of the outstanding literary trends with readings from representative masterpieces of the literature from the Middle Ages to the present.

3 class hours; 1 laboratory hour. Credit, 3.

THE DEPARTMENT.

Prerequisites: French 7 and 8, or French 5 and 6 and permission of the department.

27. (I) 28. (II) Oral Practice

Intensive oral practice, vocabulary study, grammar essentials for fluent speech. Recommended for those who desire a reasonably good command of the spoken language.

3 class hours; 1 laboratory hour. Credit, 3.

THE DEPARTMENT.

Prerequisites, French 5 and 6 or equivalent or permission of the instructor.

ADVANCED COURSES

Prerequisites, French 7 and 8, or French 5 and 6 and permission of the instructor. Since most of the advanced courses are conducted in French, the student should have a reasonable oral command of the language before electing these courses. For this purpose the student is advised to take French 27 and 28, or, if women, to spend one year in the Maison Francaise.

51. (I) 52. (II) French Literature of the Eighteenth Century (1956-57)

A detailed study of the chief writers and works of the Age of Enlightenment. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

MR. HULL.

53. (I) 54. (II) French Literature of the Twentieth Century

3 class hours; 1 laboratory hour. Credit, 3.

MISS CLARKE.

55. (I) 56. (II) French Literature of the Seventeenth Century (1957-58)

A survey of the Classic period, with readings from the most representative works. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

MR. JOHNSON.

57. (I) 58. (II) French Literature of the Nineteenth Century (1956-57)

A detailed study of the more important authors and movements. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

MR. GODING.

75. (I) 76. (II) Cours de Style

A study of syntax and idioms at an advanced level. The student is taught how to express himself clearly and logically in living French.

3 class hours; 1 laboratory hour. Credit, 3.

The Department.

79. (I) French Civilization (1957-58)

A study of those elements which lie back of the cultural contribution of France to world civilization. Subjects studied will include arts, sciences, school systems, the press, the family, social classes, influences of history and geography. The assigned readings will be drawn from contemporary French literature. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Goding.

80. (II) Advanced Language Study (1957-58)

Methods of teaching; review of grammar and pronunciation.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Goding.

ITALIAN

1. (I) 2. (II) Elementary Italian

For those who have had no previous courses in Italian. The essentials of Italian grammar, intensive drill in pronunciation, conversation and composition. Extensive reading of modern Italian writings. No credits in this course may be applied toward a degree until the close of the second semester except upon special recommendation from the Provost.

3 class hours; 1 laboratory hour. Credit, 3.

Miss Landro.

5. (I) 6. (II) Intermediate Italian

Systematic review of grammar, readings from modern authors, intensive oral drill, continued composition and conversation.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Ferrigno.

Prerequisites, Italian 1 and 2 or equivalent.

25. (I) 26. (II) Introduction to Italian Literature (1958-59)

This course traces the development of Italian literature from the 13th through the 20th centuries. The course is conducted in Italian. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Ferrigno.

Prerequisites, Italian 5 and 6 or permission of the department.

27. (I) 28. (II) Oral Italian (1957-58)

This course is intended for those students who wish to perfect their knowledge of the spoken language. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Ferrigno.

Prerequisites, Italian 5 and 6 or permission of the department.

SPANISH

1. (I) 2. (II) Elementary Spanish

For students who have had no training in Spanish. The essentials of Spanish grammar, intensive oral drill in pronunciation, fundamentals of conversation and composition, and extensive reading of short stories. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendation from the Provost.

3 class hours; 1 laboratory hour. Credit, 3.

THE DEPARTMENT.

5. (I) 6. (II) Intermediate Spanish

Systematic grammar review, intensive oral drill, continued composition and conversation; intensive and extensive readings from selected modern texts.

3 class hours; 1 laboratory hour. Credit, 3.

THE DEPARTMENT.

Prerequisites, Spanish 1 and 2 or two years of high school Spanish.

7. (I) 8. (II) Intermediate Spanish: Hispanic Culture

Intensive grammar review and a study of some of the most significant aspects of Spanish and Spanish-American civilization.

3 class hours; 1 laboratory hour. Credit, 3.

MR. GREENFIELD.

Prerequisite 2 or 3 years of high school Spanish and permission of the department or Spanish 1 and 2 with a grade of B or better.

25. (I) 26. (II) Introduction to Spanish Literature

This course traces the development of Spanish literature from the 12th through the 20th centuries. Readings from some of the most important works. The course is conducted largely in Spanish.

3 class hours; 1 laboratory hour. Credit, 3.

MR. FERRIGNO.

Prerequisites, Spanish 5 and 6 or permission of the department.

27. (I) 28. (II) Oral Spanish

Primary emphasis is placed on the oral aspects of the language: pronunciation, vocabulary building, reading, comprehension, preparation of speeches, group discussions, and conversations. Considerable attention is also paid to those elements of grammar required for correct and fluent use of the language. Recommended for major students and for those who desire a good command of the language as spoken currently in Spain and Spanish-America.

3 class hours; 1 laboratory hour. Credit, 3.

MR. WEXLER.

Prerequisites, Spanish 5 and 6 or permission of the department.

63. (I) 64. (II) Advanced Spanish Composition and Syntax (1957-58)

A study of syntax and idioms, and of those more advanced and difficult elements which constitute stylistics. An abundance of original composition leads the student to express himself clearly, logically, and fluently in living

Spanish. Open to juniors and seniors majoring in Spanish and to other qualified students by permission of the department. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Ferrigno.

Prerequisites, Spanish 27 and 28, and at least one course in Spanish literature.

81. (I) The Romanticists (1958-59)

The course is based on the principal Spanish and Spanish-American writers of the Romantic movement (1808-50 and 1832-88, respectively). Conducted in Spanish. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Wexler.

Prerequisites, Spanish 25 and 26 or permission of the department.

82. (II) The Modernists (1956-57)

The course is based on the Spanish-American Modernists of the period 1888-1910 and on their Peninsular artistic heirs. Conducted in Spanish. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Wexler.

Prerequisites, Spanish 25 and 26 or permission of the department.

83. (I) 84. (II) The Golden Age (1957-58)

The course is based primarily on the period of maximum creation, 1556-1600. Considerable attention is also paid to the Renaissance precursors (1474-1556) and to the writers of the Baroque era (1600-1700). Conducted in Spanish. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Wexler.

Prerequisites, Spanish 25 and 26 or permission of the department.

85. (I) 86. (II) Cervantes (1956-57)

Intensive reading of *Don Quijote,* with collateral readings in other Cervantine works. The course is conducted in Spanish. Given in alternate years.

3 class hours; 1 laboratory hour. Credit, 3.

Mr. Wexler.

Prerequisites, Spanish 25 and 26 or permission of the department.

RUSSIAN

Instructor in Languages.

1. (I) 2. (II) Elementary Russian

Grammar, exercises in composition and conversation, selected readings. No credits in this course may be applied toward a degree until the close of the second semester, except upon special recommendations from the Provost.

3 class hours; 1 laboratory hour. Credit, 3.

Mrs. Joa.

Prerequisites, previous language training.

5. (I) 6. (II) Intermediate Russian

A review of the fundamentals of grammar followed by more advanced study of grammatical structure and idiom. Composition, conversation, and readings in Russian fiction.

3 class hours; 1 laboratory hour. Credit, 3.
Mrs. Joa.

Prerequisites, Russian 1 and 2.

SOCIOLOGY

Professor Korson, Professor King, Assistant Professor Driver, Assistant Professor Manfredi, Mr. Wilkinson, Mr. Ypsilantis.

25. (I) and (II) Introduction to Sociology

A study of the social order, and of the individual considered as a member of his various groups.

3 class hours. Credit, 3.
The Department.

26. (II) Principles of Sociology

A survey of the theoretical development of major sociological concepts with emphasis on American sociologists and their contributions. Reading and analysis of monographs utilizing the sociological frame of references for selected topics.

3 class hours. Credit, 3.
Mr. Wilkinson.

Prerequisite, Sociology 25.

51. (I) Urban Sociology

A comparative study of modern social conditions, and methods of adjustment, with special reference to city environment. Characteristics of the population, urban ecology, and problems of adjustment in the fields of housing, health, education, and recreation are considered.

3 class hours. Credit, 3.
2:00-2:50 Tu. Th., third hour by arrangement. Mr. Manfredi.
Prerequisite, Sociology 25.

52. (II) Rural Sociology

A study of rural society from the standpoint of its population, institutions, standards of living, and their relation to urban society.

3 class hours. Credit, 3.
Mr. Ypsilantis.

Prerequisite, Sociology 25.

53. (I) Introductory Anthropology

An introduction to the principles of physical and cultural anthropology, including cross-cultural analyses of family systems, religion, economics, linguistics, and art.

3 class hours. Credit, 3.
Mr. Wilkinson.

Prerequisite, Sociology 25.

54. (II) Advanced Anthropology

An examination of the development of anthropological theory of social organization as presented in the works of European and American anthropologists. A part of the semester is devoted to an intensive analysis of a specific cultural area.

3 class hours. Credit, 3.

Mr. Wilkinson.

Prerequisite, Sociology 53.

56. (II) Race Relations

The social, economic, and political aspects of racial problems in the United States, with particular reference to the Negro and major ethnic groups. A rabbi, minister, and priest are invited to address the class, and visits are made to the respective churches.

3 class hours. Credit. 3.

Mr. Korson, Mr. King.

Prerequisite, Sociology 25.

57. (I) The Family

The study of the development of the customs of courtship and marriage of the contemporary American family. The basic causes of changes and trends of the family are considered. Such topics as mate selection, marriage laws, marital prediction, husband-wife relations, and the role of the child are considered.

3 class hours. Credit. 3.

Mr. King, Mr. Korson.

Prerequisite, Sociology 25.

61. (I) Population Problems

A consideration of the physical and social factors which influence population change through births, deaths, and migration. Special emphasis is placed upon the population problems of underdeveloped areas in the world today.

3 class hours. Credit, 3.

Mr. Wilkinson.

Prerequisite, Sociology 25.

68. (II) Industrial Sociology

A study of the role, status, and function of the worker in the industrial community. A consideration of changing technology, resulting social change and the adjustments made in the industrial community.

3 class hours. Credit, 3.

Mr. Korson.

Prerequisite, Sociology 25.

72. (II) Social Change

A study of social changes arising through invention and culture contacts and of the factors which influence acceptance or rejection of these changes.

3 class hours. Credit, 3.

Mr. King.

Prerequisites, Sociology 25, 26, and permission of instructor.

75. (I) Social Problems

A consideration of the incidence, distribution and interrelations among the major types of social tensions in human societies. Various theories of causation are evaluated. In addition to regular classroom work, research projects and field trips are required.

3 class hours. Credit, 3.

Mr. Driver.

Prerequisite, Sociology 25.

78. (II) Criminology

A study of the nature of crimes and the factors underlying criminal behavior. Attention is also given to the machinery of justice in criminal behavior; the law, the courts, police enforcement, penal and correctional institutions.

3 class hours. Credit, 3.

Mr. Driver.

Prerequisite, Sociology 25.

82. (II) Sociological Theory

An examination of the contributions of European and American writers who have concerned themselves with theories of the origin, growth, and development of human social organization.

3 class hours. Credit, 3.

Mr. Manfredi.

Prerequisite, Sociology 25.

92. (II) Introduction to Social Welfare

For senior majors and others who qualify. Contemporary problems of social concern: causes of poverty; methods of caring for adult and child dependents and defectives. A consideration of public and private agency administration and techniques, and an examination of federal, state, and local community programs.

3 class hours. Credit, 3.

Mr. Ypsilantis.

Prerequisites, Sociology 25, 75.

93. (I) 94. (II) Seminar

Admission by permission of instructor. A study of the methods of research employed by social scientists. Students, under direction of the instructor, analyze and organize such sociological material as they gather through their own research. Projects must be approved in advance by the instructor.

Credit, 3.

Hours by arrangement. Mr. Driver.

SPEECH

Professor Niedeck, Assistant Professor Zaitz, Assistant Professor Peirce, Assistant Professor Savereid, Miss Abramson, Mr. Harper, Visiting Lecturer Sickles.

3. (I) 4. (II) Public Speaking

This course is designed to give the student introductory instruction and opportunity in oral self-expression and includes both public speaking and literary interpretation.

1 class hour. Credit, 1.

The Department.

ORAL INTERPRETATION

51. (I) Voice and Diction and Oral Interpretation

The course is divided into five weeks of training and drill in the correct production of speech, followed by ten weeks of practice in the fundamentals of vocal interpretation of literature. It is possible for a student to take the five weeks of voice and diction and receive one credit.

3 class hours. Credit, 1 or 3.

Miss Abramson.

RADIO AND TELEVISION

61. (I) Fundamentals of Broadcasting

A general introduction to broadcasting: practice in preparing, rehearsing, and producing programs of various types.

2 class hours; 1 2-hour labortory period. Credit, 3.

Mr. Zaitz.

62. (II) Advanced Radio Production

An advanced course in broadcasting to provide practice in preparing and producing radio talks, radio plays and documentary programs.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Zaitz.

63. (I) Television Programming and Production

An exploration of the television medium for orientation in producing, directing and writing: network, local and educational operations both studio and remote.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Harper.

64. (II) Television Programming and Production

Practical television techniques from effective planning through effective execution by people off camera and on camera.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Harper.

Prerequisite, Speech 63.

65. (I) Writing for Television

A consideration of television writing methods for the successful production of all types of formats.

3 class hours. Credit, 3.

Miss Abramson.

66. (II) Film Production and Staging for Television

Preparation and execution of 16mm films for television: the course will prepare a 10-minute film project from the idea to editing, processing, screening and narration.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Niedeck.

Prerequisite, Speech 63.

THEATRE

71. (I) Scene Design and Construction

Theories and design in the modern theatre with assignments in developing stage settings from sketches to working drawing; from scenery construction to painting.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Peirce.

75. (I) Acting and Make-up

The course is roughly divided into ten weeks of study of emotion and imagination in acting, reading lines, rehearsing, diction, and bodily action; and five weeks of study and application of the principles of stage make-up.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Niedeck.

76. (II) Stage Direction

Study and practice in the fundamentals of directing a play. Recommended for those taking only one course in Drama.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Niedeck.

78. (II) Stage Lighting

Introduction to lighting a stage. Analysis of basic types of equipment and their application in artistic productions. Simple wiring and installations.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Peirce.

RHETORIC AND PUBLIC ADDRESS

91. (I) and (II) Extempore Speech

The theory and practice of public speaking for business and professional purposes.

3 class hours. Credit, 3.

Mr. Niedeck, Mr. Savereid.

92. (II) Discussion

Most of the semester is devoted to formal discussion: its organization and presentation. Students are given the opportunity to lead and to participate in discussions of current problems.

3 class hours. Credit 3.

Miss Abramson.

Prerequisite, Speech 91.

94. (II) Persuasion

Advanced study and practice in appeals to beliefs and action through extemporaneous speech.

3 class hours. Credit, 3.

Mr. Zaitz.

Prerequisite, Speech 91.

VETERINARY SCIENCE

Professor Bullis, Professor Smith.

75. (I) Comparative Veterinary Anatomy

A study of the structure of vertebrates with emphasis upon the comparative structure of domesticated animals, both mammals and birds.

3 class hours. Credit, 3.
11:00-11:50 M. W. F. Mr. Smith.

76. (II) General Veterinary Pathology

An introduction to the study of disease—causes, transmission, structural changes, and defense mechanisms; and the application of these principles to the prevention, control, and eradication of the common communicable and non-communicable diseases of farm animals.

3 class hours. Credit, 3.
10:00-10:50 M. W. F. Mr. Smith.
Prerequisite, Veterinary Science 75.

78. (II) General Veterinary Pathology

This course is similar to Veterinary Science 76 except that diseases of importance to wildlife, and diseases of animals transmissible to man will be considered.

3 class hours. Credit, 3.
9:00-9:50 M. W. F. Mr. Smith.
Prerequisites, Bacteriology 31, Zoology 35 or 71.

88. (II) Avian Pathology

This course is similar to Veterinary Science 76 but with application to specific communicable and non-communicable diseases of poultry.

3 class hours. Credit, 3.
8:00-8:50 M. W. F. Mr. Bullis.
Prerequisite, Veterinary Science 75.

ZOOLOGY

Professor Woodside, Professor Snedecor, Associate Professor Bartlett, Associate Professor Rollason, Assistant Professor Traver, Assistant Professor Andrews, Assistant Professor Nutting, Assistant Professor Rauch, Assistant Professor Honigberg, Assistant Professor Swenson, Assistant Professor Roberts, Mr. Snyder, Mr. Moner.

1. (I) and (II) Introductory Zoology

This course provides an introduction to the principles of biology, with special reference to the zoological aspects. The structure and activities of a representative vertebrate animal, the frog, are considered in detail and the knowledge thus gained is utilized in a comprehensive survey of the major groups of the animal kingdom. Brief introductions are given to the principles

of classification, nutrition, structure, and functions of protoplasm, genetics, heredity, development, and evolution.

2 class hours; 1 3-hour laboratory period. Credit, 3.
11:00-11:50 M. W. or 2:00-2:50 M. W. or 3:00-3:50 Tu. Th.; laboratory hours as sectioned. The Department.

25. (I) Survey of the Animal Kingdom

Lectures emphasize those aspects of the zoological sciences which are least stressed in the introductory course; the principles of classification; ecology; economic importance; and the history of zoology in relation to man's progress. The laboratory work will include several exercises in field work; studies on representatives of phyla not covered previously; the morphological adaptations of animals to special modes of existence; and some simple zoological techniques.

2 class hours; 1 2-hour laboratory period. Credit, 3.
10:00-10:50 M. F.; 1:00-2:50 Tu. or W. or Th. Mr. Nutting.
Prerequisite, Zoology 1.

35. (I) and (II) Vertebrate Physiology

An introductory course which will include consideration of circulation, respiration, digestion, metabolism, excretion, chemical and nervous coordination, muscular activity, and reproduction. The laboratory work will acquaint the student with some of the equipment and methods used in physiological studies, with emphasis on the experimental approach to the laboratory exercises.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. Snedecor, Mr. Swenson, Mr. Roberts.

50. (II) Histology of the Vertebrates

A study of the types of tissues found in the body of vertebrate animals, and of the organs in which these tissues occur. Tissues and organs of mammals are emphasized. A knowledge of comparative anatomy is advised.

2 class hours; 1 3-hour laboratory period. Credit, 3.
8:00-8:50 Tu. Th.; 2:00-4:50 Tu. or 1:00-3:50 W. Mr. Rollason.
Prerequisite, Zoology 1.

51. (I) and (II) Microtechnique of Animal Tissues

The course comprises (1) a consideration of the principles and methods of microtechnique as applied to animal tissues, and (2) a series of practical exercises in the preparation of animal tissues for microscopic examination. Registration is limited to 12 students per semester. Consult instructor for section assignments.

2 2-hour laboratory periods. Credit, 2.
Mr. Honigberg.
Prerequisite, Zoology 1.

53. (I) Principles of Genetics

Lectures and laboratory experiments concerning the laws governing the transmission of hereditary factors in plants and animals, expression and action of genes, population genetics, and the relationship of genetics to other biological sciences.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Mr. Rauch.
Prerequisite, Zoology 1.

54. (II) Natural History—Physical

Designed to orient students to the features of sky, climate and terrain which are of prime importance to the teaching naturalist. Collection, recording, preservation, and the use of natural objects will be stressed. Biological data will also be obtained as the season dictates.

1 class hour; 1 4-hour laboratory period. Credit, 3.
11:00-11:50 Tu.; 1:00-5:00 F. Mr. Nutting.
Prerequisites, Botany 1; Zoology 1.

55. (I) Natural History—Biotic

An extension of Zoology 54 with emphasis upon the fauna and flora. This course is primarily concerned with the development, local distribution, responses, and interrelationships of these organisms. Their position with respect to the physical environment will be discussed in some detail.

1 class hour; 1 4-hour laboratory period. Credit, 3.
11:00-11:50 Tu.; 1:00-5:00 F. Mr. Nutting.
Prerequisites, Botany 26; Geology 27; Zoology 54.

56. (II) Natural History—Field Studies

A program of extensive field work growing out of preparation in Zoology 54 and 55. Emphasis upon seasonal differences in abundance and stage of development of our fauna and flora.

1 class hour; 1 2-hour laboratory period. Credit, 2.
1:00-1:50 W.; 2:00-3:50 W. Mr. Nutting.
Prerequisites, Zoology 55 and permission of insructor.

64. (II) Biology of Protozoa (1956-57)

An introduction to the morphology, systematics, physiology, and ecology of protozoa with a consideration of the contributions to the problems of biology made through the study of these organisms. Given in alternate years.

1 class hour; 1 2-hour and 1 3-hour laboratory period. Credit, 3.
Mr. Honigberg.
Prerequisites, Zoology 1 and permission of the instructor.

69. (I) Animal Parasitology

Representative protozoan and helminthic parasites of man and domestic animals are studied, with special reference to their morphology and life cycles. Emphasis is placed upon parasitism as a mode of life; on hostparasite relationships; on vectors, and other modes of transmission; and on methods of control of certain of the more important human parasites.

1 class hour; 2 2-hour laboratory periods. Credit, 3.
Prerequisite, Zoology 1. Miss Traver.

70. (II) Invertebrate Zoology (1956-57)

A survey of the phyla of invertebrate animals from evolutionary and phlogenetic aspects. Morphology, modes of nutrition and reproduction, interrelationships with other animals, and distributions in time and space, are considered, as well as classification. For each phylum, representatives of the

principal classes are studied. Marine, terrestrial and freshwater forms are included. Given in alternate years.

1 class hour; 2 3-hour laboratory periods. Credit, 3.
Prerequisite, Zoology 1. Miss Traver.

71. (I) Comparative Vertebrate Anatomy

A thorough study of the anatomy of the vertebrates, with emphasis on the evolution, special modifications, and functional interrelationships of each of the organ systems. A systematic approach in both lecture and laboratory work. Animals studied in the laboratory are: protochordates, lamprey, dogfish, mudpuppy, and cat.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
1:00-1:50 Tu. Th.; 1:00-3:50 W. F. or 2:00-4:50 Tu. Th.
Prerequisite, Zoology 1. Mr. Bartlett, Mr. Snyder.

72. (II) Vertebrate Embryology

Lectures and laboratory work dealing with the development of representative animals, special emphasis being placed on the amphibian, bird and mammal.

2 class hours; 2 3-hour laboratory periods. Credit, 4.
Prerequisite, Zoology 71. Mr. Woodside, Mr. Rauch, Mr. Bartlett.

73. (I) General Cytology (1958-59)

A consideration of the morphological features of cells in relation to their function. Lectures, seminar reports and laboratory work will deal with cytoplasmic structure and inclusions and nuclear phenomena. Given in alternate years.

2 class hours; 1 3-hour laboratory period. Credit, 3.
Prerequisites, Zoology 50. Mr. Rollason.

74. (II) Limnology (1957-58)

The study of inland waters, emphasizing the geological, physical, chemical and biological aspects of this problem. Standard methods for making physical and chemical tests and measurements, and for the collection of biological materials, are used by students in the numerous field trips. Biological material collected in the field is studied in the laboratory. Given in alternate years.

2 class hours; 2 3-hour laboratory periods. Credit. 4.
Miss Traver.
in cooperation with the departments of Botany, Entomology, Geology, Public Health, and Zoology.

Prerequisites, Botany 1; Zoology 1; Chemistry 1, 2; and permission to register. Strongly recommended: Botany 25, 26; Entomology 26; Zoology 25; Geology 27, 28; Chemistry 29, 30.

78. (II) Genetics of Animal Populations (1957-58)

The principles of the genetics of animal populations with emphasis upon its basic techniques and methods, its goals and contributions. The population approach to the study of the origin of species and human genetics will be considered also. Given in alternate years. Enrolment is limited to ten.

1 2-hour lecture-discussion period per week. Credit, 2.
Mr. Rauch.
Prerequisites, Zoology 53 or its equivalent and permission of the instructor.

80. (II) Ornithology

An introduction to the study of avian biology with emphasis on structural and functional adaptations, and particularly the behavioral patterns of birds. Laboratory periods include discussions of assigned readings in current literature in addition to field trips for identification and methods of field study.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

8:00-8:50 Th.; 3:00-4:50 M. F. or 9:00-11:00 Tu.; 3:00-4:50 F.

Mr. Bartlett, Mr. Nutting.

Prerequisite, Zoology 1.

81. (I) Vertebrate Zoology

An introduction to the vertebrates, their classification and ecology, with particular emphasis on the fishes. Field trips for the study of local fauna will be included as a part of the laboratory exercises. Course limited to eighteen students.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

9:00-9:50 W.; 1:00-2:50 M. F. Mr. Andrews, Mr. Bartlett.

Prerequisite, Zoology 1.

82. (II) Mammalogy (1956-57)

The paleontology, taxonomy, speciation, natural history, range and distribution of the class Mammalia. Primary emphasis will be placed upon the study of local fauna, including at least one week-end collecting trip as part of the laboratory exercises. Course limited to fifteen students. Given in alternate years.

2 class hours; 1 2-hour laboratory period. Credit, 3.

Mr. Snyder.

Prerequisites, Zoology 1 and permission of instructor.

83. (I) General and Cellular Physiology

A course designed to introduce the student to modern trends in physiology. Emphasis is on the chemical and physical activities of the single cell. Topics include: protoplasmic organization, cellular metabolism, permeability, bioelectric phenomena, muscle contraction and radiation biology.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Swenson.

Prerequisites, 1 year of biology; organic chemistry.

84. (II) Comparative Physiology

A course designed to acquaint students with physiological principles involved in adaptations of animals to their environments. In the laboratory, experimental methods used to study adaptive mechanisms will be emphasized.

3 class hours; 1 3-hour laboratory period. Credit, 4.

Mr. Roberts.

Prerequisites, Zoology 1, 35 or 83.

85. (I) Classes of Arthropods Other Than Insects

Arthropods are studied from the phylogenetic standpoint, with special reference to their relationship to the origin and evolution of insects.

1 class hour; 2 2-hour laboratory periods. Credit, 3.

12:00-12:50 W.; 1:00-2:00 W. F. Mr. Hanson.

86. (II) Fishery Biology

Theory in the practice of regulating freshwater fisheries; the physical and biological conditions of the environment and their influence on fish populations.

2 class hours; 1 2-hour laboratory period. Credit, 3.

9:00-9:50 Tu. Th.; laboratory hours by arrangement. Mr. Andrews.

Prerequisite, Zoology 81 and permission of instructor.

87. (I) Endocrinology

Emphasis will be directed toward the importance of the endocrines in their control over normal functions (growth, metabolism, reproduction, etc.), in a variety of animals.

2 class hours; 1 3-hour laboratory period. Credit, 3.

Mr. Snedecor.

Prerequisite, Zoology 1.

91. (I) 92. (II) Special Problems in Zoology

Qualified seniors who have met departmental requirements for specialization in the field of zoology may arrange for work on a special problem in zoology.

Credit, 1-3.

The Department.

Invertebrate Zoology, Marine Biological Laboratory, Woods Hole, Massachusetts.

Credit, 3.

Invertebrate Embryology, Marine Biological Laboratory, Woods Hole, Massachusetts.

Credit, 3.

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Malcolm James Chisholm, m.d., c.m. (Dalhousie University), *Assistant Physician.* Out Patient Department

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Mrs. Lucie Knowles Davey. Thatcher House

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[1]DAVID RIDGLEY CLARK, B.A. (Wesleyan University), M.A., PH.D. (Yale University), *Instructor in English.*

[2]KATHERINE ALLEN CLARKE, A.B. (Goucher College), M.A. (Middlebury College), *Docteur de l'Universite de Grenoble, Associate Professor of French.* Liberal Arts Annex

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[1]On leave of absence.

[2]On leave of absence second semester.

EDWARD CLIFFORD, A.B. (Roosevelt College), M.A. (University of Chicago), *Instructor in Psychology.* Liberal Arts Annex

WILLIAM GEORGE COLBY, B.S.A. (University of Illinois), M.S., PH.D. (Rutgers University), *Professor of Agronomy and Head of Department.* Stockbridge Hall

[1]ALTON BRIGHAM COLE, B.S. (University of Massachusetts), M.F. (Yale University), *Instructor in Forestry.*

DAN STEAD COLLINS, B.S. (University of Pennsylvania), M.A. (University of North Carolina), *Instructor in English.* Old Chapel

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EDWARD LYON DAVIS, A.B. (Harvard University), M.S. (University of Massachusetts), *Instructor in Botany.* Clark Hall

EDWARD PARKS DAVIS, JR., B.A. (Virginia Military Institute), *Captain, Armor, U.S.A., Assistant Professor of Military Science and Tactics.* Drill Hall

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[1]On military leave.

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[1]J. MURRAY ELLIOT, B.S. (McGill University), M.S. (University of Vermont), *Assistant Professor of Dairy and Animal Science*

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DWIGHT EDMUND ERLICK, A.B. (Colby College), M.A., PH.D. (Columbia University), *Assistant Professor of Psychology.* Liberal Arts Annex

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[1]On leave of absence.

DAVID AUSTIN EVANS, B.S., M.S. (Pennsylvania State University), *Assistant Professor of Dairy and Animal Science* Flint Laboratory

JOHN NELSON EVERSON, B.S., M.S. (University of Massachusetts), *Assistant Professor of Agronomy.* Stockbridge Hall

WILLIAM LANCELOT EWBANK, B.S. in ED. (Kansas State Teachers College), *Lieutenant Colonel, USAF, Assistant Professor of Air Science.* Drill Hall

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CARL RAYMOND FELLERS, A.B. (Cornell University), M.S., PH.D. (Rutgers University), *Professor of Food Technology and Head of Department.* Chenoweth Laboratory

TSUAN HUA FENG, B.S. in C.E. (National Pei-Yang University), M.S., PH.D. (University of Wisconsin), *Assistant Professor of Civil Engineering.* Engineering Building

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[2]GORDON FIELD, B.S., M.S. (University of Massachusetts), *Instructor in Entomology.*

WILLIAM FRANKLIN FIELD, B.S. (West Chester State Teachers College), ED.M. (Temple University), PH.D. (University of Maryland), *Associate Professor of Psychology and Director of Guidance.* South College

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ROY MARSHALL FISHER, A.B. (Clark University), *Assistant Professor of Physics.* Hasbrouck Laboratory

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JOHN MAURICE FITZGERALD, B.S. (U. S. Merchant Marine Academy), B.B.A. (Southern Methodist University), *Instructor in Accounting.* Draper Hall

RICHARD CAROL FOLEY, B.S., M.S. (University of Massachusetts), PH.D. (Rutgers University), *Professor of Dairy and Animal Science.* Stockbridge Hall

WILLIAM FOOTRICK, B.S., M.P.E. (Springfield College), *Associate Professor of Physical Education.* Physical Education Building

THOMAS WALTON FOX, B.S., M.S. (University of Massachusetts), PH.D. (Purdue University), *Professor of Poultry Husbandry and Head of Department.* Stockbridge Hall

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[2]On military leave.

CHARLES FREDERIC FRAKER, JR., A.B. (University of Massachusetts), B.MUS. (Yale University), M.A. (Middlebury College), *Instructor in Romance Languages.* Machmer Hall

[1]RALPH LYLE FRANCE, B.S. (University of Delaware), M.S. (University of Massachusetts), *Professor of Bacteriology and Head of Department.*

ARTHUR PERKINS FRENCH, B.S. (Ohio State University), M.S. (University of Massachusetts), PH.D. (University of Minnesota), *Professor of Pomology and Plant Breeding and Head of Department of Pomology.* French Hall

PAUL ADELARD GAGNON, B.S. (University of Massachusetts), M.A. (Harvard University), *Instructor in History.* Old Chapel

PHILIP LYLE GAMBLE, B.S., M.A. (Wesleyan University), PH.D. (Cornell University), *Professor of Economics and Head of Department.* Machmer Hall

RICHARD FRANKLIN GARBER, B.S. (Springfield College), M.ED. (Pennsylvania State University), *Assistant Professor of Physical Education.* Physical Education Building

MARY ELLEN MONICA GARVEY, B.S. (University of Massachusetts), *Associate Professor of Bacteriology.* Marshall Hall Annex

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MARY ELIZABETH GILMORE, B.S. (Simmons College), M.S. (The Catholic University of America), *Associate Professor of Nursing.* Engineering Building

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GEORGE BENJAMIN GODDARD, B.S. (University of Massachusetts), *Instructor in Floriculture.* French Hall

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[2]ALBERT EDWARD GOSS, B.A., M.A., PH.D. (State University of Iowa), *Professor of Psychology.* Liberal Arts Annex

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[1]On leave of absence.

[2]On leave of absence for Second Semester.

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SUMNER MELVIN GREENFIELD, A.B. (Boston College), A.M. (Boston University and Harvard University), *Instructor in Romance Languages.* Machmer Hall

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[1]On leave of absence.

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[1]On leave of absence for Second Semester.

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[1]Guy Rene Mermier, A.B. (Lycee Champollion), CERTIFICAT DE LITTERATURE ET CIVILISATION AMERICAINE, DIPLOME D'ETUDES SUPERIOR (University de Grenoble), *Instructor in Romance Languages.*

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Helen Swift Mitchell, A.B. (Mt. Holyoke College), PH.D. (Yale University), *Dean of the School of Home Economics.* Edna Skinner Hall

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[2]John William Mohn, M.E. (Stevens Institute of Technology), B.S. (Worcester Polytechnic Institute), M.S. (Stanford University), *Associate Professor of Electrical Engineering.*

John George Moner, A.B. (Johns Hopkins University), M.A., PH.D. (Princeton University), *Instructor in Zoology.* Marshall Hall

[3]Bruce Robert Morris, A.B. (Western Reserve University), M.A. (Ohio State University), PH.D. (University of Illinois), *Professor of Economics.* Machmer Hall

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Walter Gregory O'Donnell, A.B., M.A. (Western Reserve University), LL.B. (John Marshall Law School), *Professor of Industrial Administration.* Draper Hall

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[1]On leave of absence for military service.
[2]On leave of absence.
[3]On leave of absence for Second Semester.

WILLIAM GREGORY O'DONNELL, B.S. (University of Massachusetts), M.A., PH.D. (Yale University), *Professor of English.* Old Chapel

SALLY ANN OGILVIE, B.S., M.ED. (University of North Carolina), *Instructor in Physical Education for Women.* Drill Hall

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[1]OTTO PAUL PFLANZE, B.A. (Maryville College), M.A., PH.D. (Yale University), *Assistant Professor of History*

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[1]ROBERT AARON POTASH, A.B., A.M., PH.D. (Harvard University), *Assistant Professor of History*

FRANK ELWOOD POTTER, B.S. (University of Maine), M.S. (University of Maryland), PH.D. (Pennsylvania State University), *Assistant Professor of Dairy and Animal Science.* Flint Laboratory

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FRANK PRENTICE RAND, A.B. (Williams College), A.M. (Amherst College), L.H.D. (University of Massachusetts, Williams College), *Professor of English.* Old Chapel

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[1]On leave of absence.

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HAROLD RAUCH, B.S. (Queens College), M.S. (University of Illinois), PH.D. (Brown University), *Assistant Professor of Zoology.* Fernald Hall

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[1]SIDNEY SCHOEFFLER, B.S. (New York University), A.M. (University of Pennsylvania), PH.D. (The New School for Social Research), C.P.A. (New Jersey), *Associate Professor of Economics.*

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HAROLD WILLIAM SMART, A.B. (Amherst College), LL.B. (Boston University), *Associate Professor of Business Law.* Draper Hall

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[1]On leave of absence.

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H. T. U. SMITH, B.S. (Wooster College), M.A., PH.D. (Harvard University), *Professor of Geology and Mineralogy and Head of Department.* Fernald Hall

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MARION ESTELLE SMITH, B.S., M.S. (University of Massachusetts), PH.D. (University of Illinois), *Assistant Professor of Entomology.* Fernald Hall

RUSSELL EATON SMITH, B.S. (University of Massachusetts), V.M.D. (University of Pennsylvania), *Professor of Veterinary Science.* Paige Laboratory

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CLARK LEONARD THAYER, B.S. (University of Massachusetts), *Professor of Floriculture and Head of Department.* French Hall

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ROBERT GARLAND TUCKER, A.B. (Amherst College), A.M. (Harvard University), *Instructor in English.* Old Chapel

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JOHN EDWARD TYLER, JR., A.B., A.M. (College of the Holy Cross), *Instructor in Chemistry.* Goessmann Laboratory

MAURICE ALBERT UNGER, A.B., LL.B. (Duke University), *Associate Professor of Business Finance.* Draper Hall

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[1]On leave of absence.

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HAROLD GOODHUE VATTER, B.A. (University of Wisconsin), M.A. (Columbia University), PH.D. (University of California), *Associate Professor of Economics.* Machmer Hall

JOHN HENRY VONDELL,
Associate Professor of Poultry Husbandry. Stockbridge Hall

ROBERT WANNER WAGNER, A.B. (Ohio University), M.A., PH.D. (University of Michigan), *Professor of Mathematics.* Machmer Hall

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MERIT PENNIMAN WHITE, A.B., C.E. (Dartmouth College), M.S., PH.D. (California Institute of Technology), *Professor of Civil Engineering and Head of Department.* Engineering Building

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MRS. MARTHA ROCKHOLD WRIGHT, B.S. (Miami University), *Instructor in English.* Old Chapel

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ANA MARIA CORDONES, PROFESORA NACIONAL DE INGLES, (Instituto Nacional del Profesorado Secundario de la Capital), *Instructor in Spanish.* Machmer Hall

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Mrs. Helen Long Field, a.b. (Ohio Wesleyan University), m.a. (Temple University), *Instructor in Psychology.* Liberal Arts Annex

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Mrs. Vilma Veronica Joa, b.s. (University of Tartu), *Instructor in Russian.* Machmer Hall

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John King, b.a., mus.b., m.a. (Cambridge University) ph.d., (University of Toronto), f.a.g.o., *Visiting Professor of Music.* Memorial Hall

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TEACHING FELLOWS

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Margaret Alice Parsons, B.S. (University of Massachusetts), *Teaching Fellow in Entomology.* Fernald Hall

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TEACHING FELLOWS

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Harue Koike, b.a. (Mt. Holyoke College), *Departmental Fellow in English.* Old Chapel

John Francis O'Rourke, b.a. (University of Massachusetts), *Departmental Fellow in Sociology.* Machmer Hall

Fred Schwartz, b.a., m.a. (College of the City of New York), *Departmental Fellow in Psychology.* Liberal Arts Annex

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[1]On leave of absence for First Semester.

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PORTIA ADELE IERARDI, B.S., M.A. (Boston University), *Experiment Station Editor.* Munson Hall

ELMAR JARVESOO, AGR.DIP., MAG.AGR. (Tartu University), DR.AGRI. (Berlin University), *Assistant Professor, Research, Agricultural Economics.* Draper Hall

LINUS HALE JONES, B.S., M.S. (University of Massachusetts), PH.D. (Rutgers University), *Assistant Professor, Research, Botany.* Clark Hall

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KAROL JOSEPH KUCINSKI, B.S., M.S., PH.D. (University of Massachusetts), *Assistant Professor, Research, Agronomy.* Stockbridge Hall

WILLIAM HENRY LACHMAN, JR., B.S., M.S. (Pennsylvania State University), *Professor, Research, Vegetable Gardening.* French Hall

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MALCOLM ARTHUR MCKENZIE, PH.B., A.M., PH.D. (Brown University), *Director, Shade Tree Laboratories.* Shade Tree Laboratories

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UNIVERSITY OF MASSACHUSETTS ENROLLMENT — September, 1956

UNDERGRADUATE COLLEGE

Class	1957		1958		1959		1960		Total		
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Total
Arts and Science	227	196	204	186	185	229	249	339	865	950	1,815
Engineering	162	2	178	1	250	2	304	5	894	10	904
Business Administration	160	4	125	6	88	8	95	12	468	30	498
Agriculture	79	7	62	5	78	5	57	4	276	21	297
Home Economics	0	37	0	32	0	41	0	40	0	150	150
Physical Education	21	0	18	0	21	0	18	0	78	0	78
Nursing	0	3	0	6	0	17	0	25	0	51	51
Total	649	249	587	236	622	302	723	425	2,581	1,212	3,793
Total by Classes	898		823		924		1,148		3,793		
Specials									12	25	37

GRADUATE SCHOOL

	Men	Women	Total
Regular	200	41	241
Special	69	43	112
			353

STOCKBRIDGE SCHOOL

	1957	1958	Total
Men	150	175	325
Women	1	6	7
			332
Special			1

SUMMER SCHOOL

660

SUMMARY

Undergraduate School	3,830
Graduate School	353
Stockbridge School	333
	4516

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November, 1956

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There are a number of worth-while activities of the University which are handicapped by lack of funds and for which small endowments would make possible a greater measure of service to our students and to the Commonwealth. The religious work on the Campus is an example. This is now carried on in a very limited way by current private contributions. Further information concerning this and other activities in similar need will be gladly furnished by the President.

SUGGESTED FORM

"I give and bequeath to the Trustees of the University of Massachusetts, at Amherst, Massachusetts, the sum of .... dollars."

(1) (Unrestricted)

"To be used for the benefit of the University of Massachusetts in such manner as the Trustees thereof may direct."

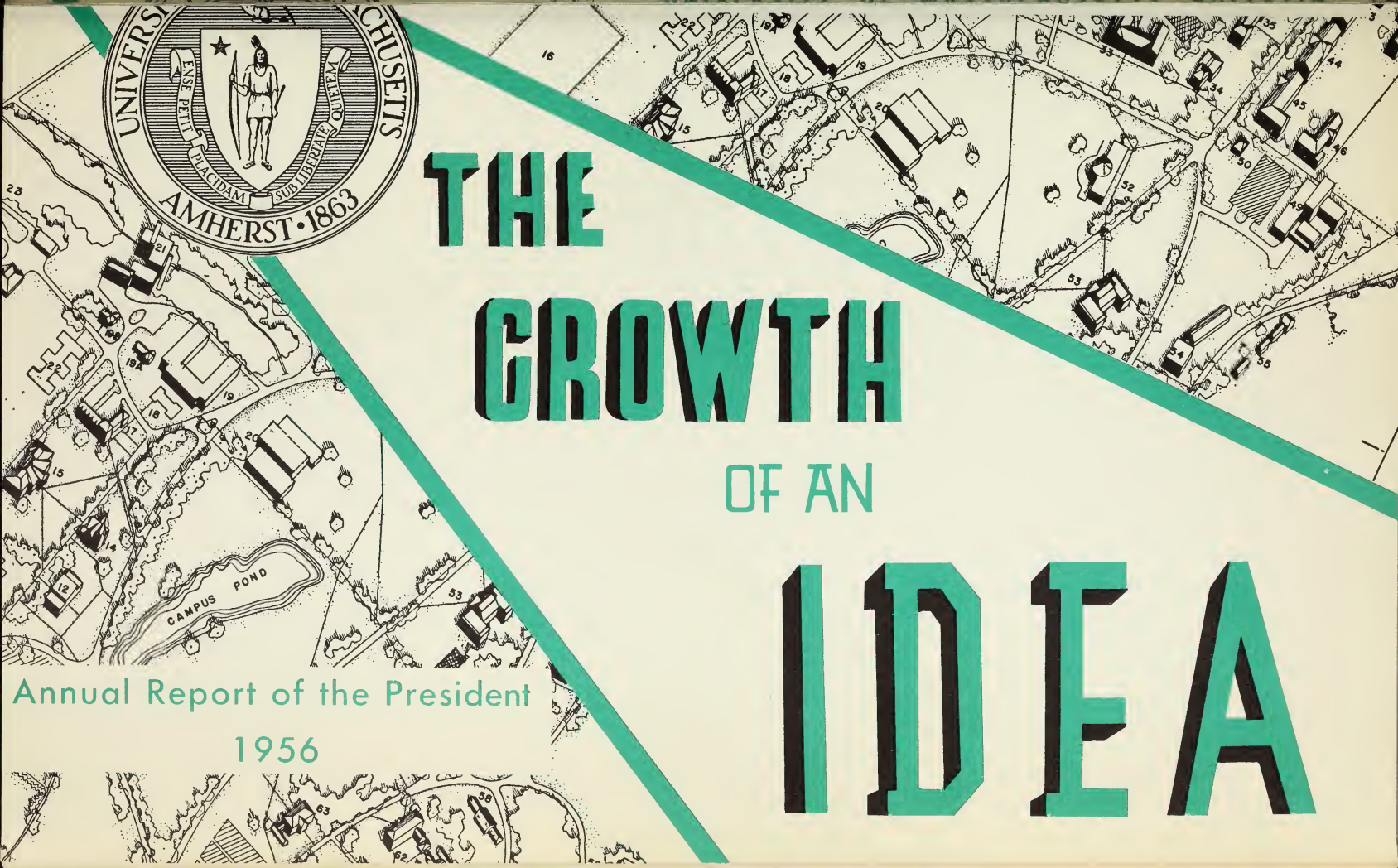
or (2) (Permanent Fund: income unrestricted)

"to constitute an endowment fund to be known as the .... Fund, such fund to be kept invested by the Trustees of the University of Massachusetts and the income used for the benefit of the College in such manner as the Trustees thereof may direct."

or (3) (Specific Purposes)

"to be used for the following purposes,"

(Here specify in detail the purposes.)



THE GROWTH OF AN IDEA

Annual Report of the President

1956

VOLUME XLIX APRIL, 1957 NUMBER 3

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Publication of this Document Approved by George J. Cronin, State Purchasing Agent 2M-3-57-919847

UNIVERSITY OF MASSACHUSETTS
OFFICE OF THE PRESIDENT

February 28, 1957

The Honorable Joseph W. Bartlett
Chairman, Board of Trustees
The University of Massachusetts

Dear Dr. Bartlett:

I am privileged to present to you, to the Board of Trustees, and to the Governor and Citizens of the Commonwealth this report for the University of Massachusetts covering the year January 1, 1956 to January 1, 1957.

Respectfully,

Jean Paul Mather

Jean Paul Mather
President

The

GROWTH

of an

IDEA

The 1954 report was entitled, "The Rebirth of an Idea," in tribute to the tremendous and spontaneous support given to the University of Massachusetts by the General Court and the people of the Commonwealth. The revolutionary material appropriations of that year reflected a public reawakening to the need for extended public higher education opportunities to the able youth of this state. The report for 1955 was captioned "The Dedication of an Idea" and spelled out the spiritual, moral, and human-policy characteristics and needs of a great University.

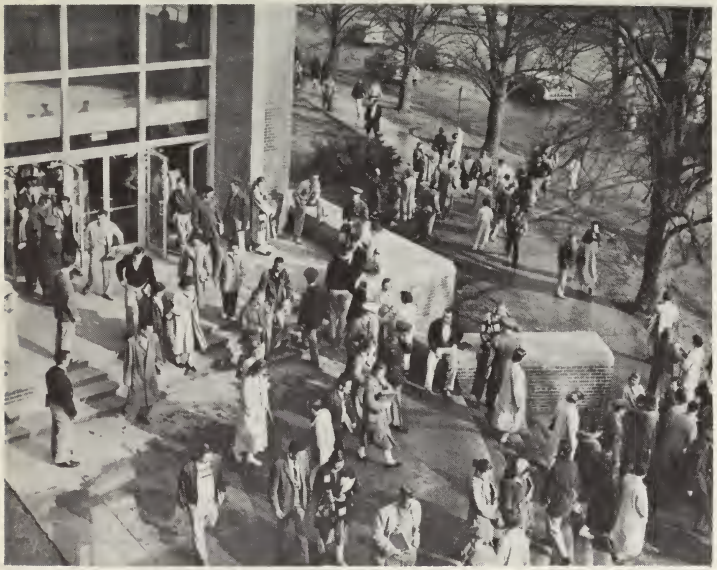
This year's report reflects the joint progress of spirit and support in an institution coming of age with new responsibilities and greatly extended horizons. Chancellor Kimpton of the University of Chicago set the tone for what we are experiencing in Amherst, Massachusetts when he said in reference to his institution:

> This year has carried us farther toward our objectives than we dared to hope. With all its physical manifestations of success, it has produced something within us far less tangible. I can describe it only as a quiet but confident maturity. It is said the mark of adolescence is to be prepared, loudly and blatantly, to die for a cause and maturity comes only when one is prepared, humbly and quietly but confidently, to live for one.

This year of 1956 has seen the University of Massachusetts, *an idea of public concern,* grow in confidence, wisdom, strength, and maturity. We know without doubt that we are *living* for a cause.

Growth For Our Faculty

The basic ingredient and catalyst of the education formula and process is the inspired teacher, teaching and searching in classroom and laboratory, that others may know the liberating freedom of truth. The meaning of university, spelled with a small "u," is the concept of a catholic human interest in the universal search for truth. Historic policy changes



NEW BUILDING AND OCCUPANTS
. . . and more to come.

of significance to the entire faculty were accomplished this year. The changes were both ideological and material.

On July 27, 1956 the Governor signed the Freedom Bill, Chapter 556 of the General Laws. The new law provided extended freedom and autonomy to the Board of Trustees of the University in matters of hiring, promotion, demotion, salary determination and staffing pattern for the entire professional teaching, research, and officer administrative group. *Within appropriations,* this legislation gives the Trustees more autonomy and flexibility in personnel policy than they have exercised since 1924 and the original establishment of control by the state Division of Personnel and Standardization.

In the present competitive market for people of scientific, professional and special ability (for "men of ideas" if you will) any concept of rigidity and standardization is a sure guarantee of mediocrity in the long run. Great teachers, scientists, and engineers do not fit any system of controlled *minima* for either starting pay or continuing advancement. An intelligent democracy does not spend money or use resources, public or private, under such centralized absentee-control concepts.

Having "won the law" the University did not "lose

the legislature." Supplemental appropriations subsequent to passage of the Freedom Bill made possible more than fifty promotions in the teaching ranks and the hiring of several outstanding faculty members above previously established minimum salaries, and in appropriate ranks.

> *"The University of Massachusetts must be a peer and not a pawn in the great family of state universities now training the leaders and citizens of the nation and world of tomorrow."* From the 1955 President's Report.

Following closely upon the passage of the Freedom Bill the people of the University were again encouraged by a significant and morale-boosting salary increase. Recommended by the impartial professional management survey of Barrington Associates, this plan became legislation by General Court action, effective October 1, 1956. The University is sincerely grateful for the enactment of both the personnel and the salary legislation. Beyond gratitude, however, there is honest recognition of the responsibility each member of this institution now has to translate the effects of the legislation into a stronger faculty for a greater University — greater in quality as well as quantity. The opportunity is here for every individual to *grow,* under improving conditions of work, toward greater service than ever before to the students we train for a state, a nation, and a world life.

Growth For Our Students

The September 1956 enrollment figure of 4,516 represents a 10.3 per cent increase over the September 1953 total of 4,091. Applications for admission from in-state freshmen totaled 6,140. More than 1,000 additional applications were given out in the office of the Registrar, and 3,000 application requests were received from out-of-state. Applications finally returned from in-state freshmen numbered 4,012. *Only Massachusetts residents were accepted.*

After the standard College Entrance Board examinations were given to more than 2,500 of the final applicants or qualifying certificates were received from high school principals, a freshman class of 1,148 entered the University in September 1956. Some idea of the quality of these entrants may be gained from guidance evaluations showing the battery of entrance test averages compared with previously admitted classes. These averages show the upper 50 per cent of this 1956 entering class scored higher than the upper 25 per cent of the June 1956

CHEMISTRY BUILDING

graduating class, and above the upper 35 per cent of the class entering in September 1955.

". . . all our able youth — not some — must be given the opportunity to contribute to our common task according to their inherent ability. We cannot afford to say, 'Their lot forbade.'" From the 1955 President's Report.

Live Births in Massachusetts and Approximate Date of Entering College

Year of Birth	Number	Date of Entering College
1939	62,575	Sept. 1957
1940	65,369	Sept. 1958
1941	70,228	Sept. 1959
1942	83,371	Sept. 1960
1943	85,743	Sept. 1961

Increases in requests for admission are a function of at least three forces. The first is the number of *able* and *qualified* students graduating from high school. This number is going to increase from baby boom birth rates since 1940 as well as the long range increase in the number of students who enter high school and actually graduate at the preparatory level. The second is the long range increase in number of high school graduates who desire and seek higher education. This number has roughly doubled in the United States every twenty years for the past century. The third force is increased interest in the program of the University of Massachusetts as the breadth and scope of its programs become better known throughout the state and nation.

The distribution of students now enrolled — shown on the map accompanying this report — demonstrates the broad geographical selection from nearly every town and city in the Commonwealth. That more than 58 per cent come from Worcester and east demonstrates the "urban pull" or attraction of rapidly expanding opportunities in the fields of Engineering, Business, Science, Nursing and Education. The wide variety of courses offered in more than forty fields of knowledge are becoming known and recognized, as general awareness of the evolution and development of the University grows. The Department of Education in the College of Arts and Science was organized September 1, 1956 into a School of Education. For our students the growth of

LIBERAL ARTS BUILDING

To broaden the campus horizon

this School offers extended opportunity for a strong teacher training program. The responsibility of the University in this field is obviously a function of the greatest single problem in education at all levels, now and in the future. Need for teachers in a situation that is already "short supply" represents a first things first approach to a matter of public policy and necessity.

Growth of Facilities

"To every thing there is a season, and a time to every purpose under heaven
. . . a time to build up
. . . a time to gather stones together."
Ecclesiastes 3

Undergraduate classes and a majority of faculty offices were transferred out of the obsolete and fire hazardous quarters of the old Mathematics building, the Liberal Arts Annex, and North College in October 1956. Faculty and students moved into beautiful new Machmer Hall, the emergency classroom building provided by an appropriation of $1,000,000 in 1954. Shortly afterward construction began on the $1,871,000 Women's Physical Education Building. Nearing completion also at the close of the year was the large animal disease laboratory — a $50,000 gift from Red Acre Farms, Inc.

Nearing completion and planned to open on February 1, 1957, the $2,000,000 Student Union represents the tangible growth of intangible dreams for a cultural, recreational, organizational center for the extra curricular life of the entire student body. The Union is being amortized by a student fee which spells out tangibly the continuing policy of assessing rental, food, and recreational costs *outside* the regular public budget of the University.

A welcome Christmas season transfer of $786,000 of special state funds to allow awarding of construction contracts to begin the new Public Health Building and the Chemistry Building brought capital outlay appropriations for the past three years to a total of $12,125,000. This physical growth factor represents an average annual appropriation of over four million dollars and a total appropriation $3,425,000 in excess of the previously accumulated 91 years at cost of all state funds provided for capital outlay. More than 80 per cent of these facilities are in the Arts and Science and general education area — the basic first two years of the program.

A second annual appropriation of $100,000 in capital outlay for equipment allows for replacement of the *obsolete* and purchase of the *up-to-date* in the laboratories and classrooms of the entire campus.

Faculty and student morale, competitive stamina, standards, and general reputation all *grow* with these quantitative and material facility-requisites for the quality of a modern and progressive university.

Growth in a World Context

> *"At the beginning of the year 1876 the Trustees were called to perform a most unexpected, but most important, duty in connection with agricultural education. The Japanese Government having determined to establish an agricultural college, and having selected the Massachusetts College as a model, very naturally looked to its faculty and graduates for advice and assistance."* From the Annual Report, January 1878.

During the year the University was invited by the International Cooperation Administration to send a survey team to the University of Hokkaido, Sapporo, Japan, to negotiate a contract between the two universities for the purpose of exchanging technical professional personnel in the field of agriculture. A memorandum of agreement has been signed by the presidents of the two institutions renewing the relationships of 80 years' standing, and recalling that the first exchange of professional personnel in 1876 under the leadership of Dr. W. S. Clark resulted in 15 Americans from Massachusetts Agricultural College serving at the University of Hokkaido and contributing substantially to the agriculture of that island. When these professors returned to America they brought with them many important crops. Two — Japanese millet and the soy bean — have become domestic crops of significance here in America.

In this renewal of relationships between the two universities, it is proposed that a contract be drawn between the University of Massachusetts and the International Cooperation Administration to support a program that will call for the training of nine Japanese professors each year at the University of Massachusetts and the initiation of research, extension, and teaching at the University of Hokkaido in the fields of forage crop management, agricultural marketing, food technology, poultry science, and home economics in a phased program over a period of four years. The choice of the University of Massachusetts by the University of Hokkaido for this exchange is evidence of the world reputation enjoyed by persons trained in agriculture at Massachusetts and the im-

University of Massachusetts Enrollment

UNDERGRADUATE COLLEGE

Class	1957 Men	1957 Women	1958 Men	1958 Women	1959 Men	1959 Women	1960 Men	1960 Women	Total Men	Total Women	Total
Arts and Science	227	196	204	186	185	229	249	339	865	950	1815
Engineering	162	2	178	1	250	2	304	5	894	10	904
Business Administration	160	4	125	6	88	8	95	12	468	30	498
Agriculture	79	7	62	5	78	5	57	4	276	21	297
Home Economics	0	37	0	32	0	41	0	40	0	150	150
Physical Education	21	0	18	0	21	0	18	0	78	0	78
Nursing	0	3	0	6	0	17	0	25	0	51	51
Total	649	249	587	236	622	302	723	425	2581	1212	3793
Total by Classes	898		823		924		1148		3793		
Specials									12	25	37

GRADUATE SCHOOL

	Men	Women	Total
Regular	200	41	241
Special	69	43	112
			353

STOCKBRIDGE SCHOOL

	1957	1958	Total
Men	150	175	325
Women	1	6	7
			332
Special			1

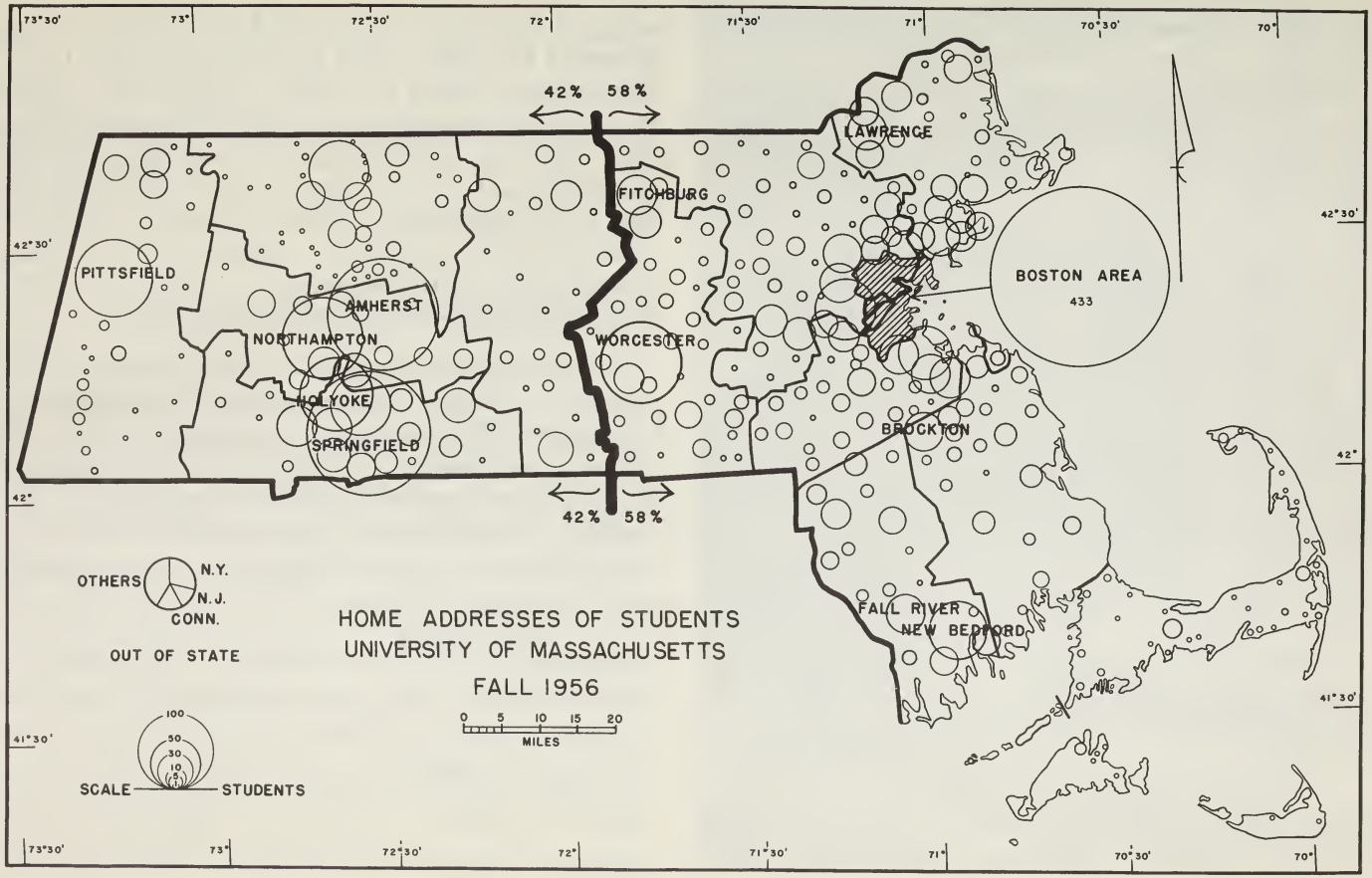
SUMMER SCHOOL

660

Summary

Undergraduate School	3830
Graduate School	353
Stockbridge School	333
Total Enrollment	4,516

Office of Publications, *November, 1956*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HOLYOKE
SPRINGFIELD
WORCESTER
BROCKTON
FALL RIVER
NEW BEDFORD
OTHERS
N.Y.
N.J.
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HOME ADDRESSES OF STUDENTS
UNIVERSITY OF MASSACHUSETTS
FALL 1956
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SCALE
STUDENTS

pact of the influence that Dr. Clark had on the Japanese when he was there 80 years ago.

This program as it develops will not only bring the University prestige and recognition but represents practical, educational, and spiritual growth evidencing responsibility to the world as well as the local scene.

> *"It is fifty years since the departure of President Clark, but our admiration for him has increased with the years, and the words dropped here and there by our great master seem to guide us till the ages come."* Shosuke Sato, member of the first graduating class and three times President of Hokkaido University, at a celebration in 1926.

Growth for the Future

> *". . . of faith in the future of a state university second to none; of sanguine hope and strong optimism that the people of Massachusetts and their duly elected representatives will continue to develop higher education as the greatest bulwark of democracy and progress."* From the 1954 President's Report.

Maturity is also a state of vision, and vision that is not just visionary. Horizons practical and idealistic are tomorrow's successful translation of sound planning for today. The University master plan for the next ten years in terms of plant and physical growth was completed in 1956 with funds from the state Division of Building Construction. With the blueprint laid and projections completed for facilities to accommodate 10,000 students in 1965, it is essential that constructive planning for maximum educational performance and service for each tax dollar expended be the immediate goal.

As an example of the forward planning, we are preparing a vital, effective summer program at the University. This administration does not believe that the present curricular program involving a short six week summer session is efficient, realistic, or educationally sound for the years ahead in terms of the population and service demands of our expanding and progressive economy. With the exception of research and extension programs in agriculture, and individual or contract research in other fields, the plant, facilities, and professional staff of the University are in large part idle from late in May to the first of July and again from the second week in August to the last week in September. The present summer teaching program (outside the engineering surveying courses typical of all engineering school opera-

tions) is primarily a make-up and teacher training activity in which only a part of the staff and facilities are used. During the relatively idle periods mentioned the University is costing the taxpayers of the Commonwealth in excess of $17,000 per day with considerably less than proportionate returns. This comment is not related to business efficiency terms only.

What is contemplated is a budget proposal to be submitted for 1958 that envisions a modest increase in staff expenditure for a more than proportionate utilization of physical and manpower resources. Such policy does not destroy vacation or change of experience possibilities for staff. Rather it embodies additional staff and additional staff funds to allow *all who desire* to teach here in the summer, as well as staff from other universities seeking a quarter or semester of change in other environs, to make the University of Massachusetts a year-round educational center. Anything short of such a program is an inefficient use of public funds and an unrealistic answer to pressing future demands.

Accordingly, through proper committees and staff discussions the curriculum and schedule can be rearranged during the coming year to allow for such an extension of program *provided the extra summer*

STUDENT UNION
Growth of Facilities

school budget is provided in coming appropriations. Such a program will provide for more undergraduate educational opportunities in at least three ways. First the possibility will exist for students in many fields to complete baccalaureate requirements in three years. The very exceptional students, under a more flexible curriculum, may be able to accelerate to an even greater degree. And a third group of new students can be admitted to such an expanded total program. In addition to progressive total enrollment growth, this administration conceives this additional change in future operations as the only realistic *quid pro quo* for the expanded and extensive present support of the University of Massachusetts. Other changes are also being considered in a forward-looking manner. Our growth responsibility involves more imagination than just a continuation of *past* practices for *more* people.

Jean Paul Mather
President

SYMBOL AND STUDENT FROM JAPAN
Growth in a World Context

Personnel Changes

AS OF JANUARY 1, 1957

FACULTY

Deaths:

RICHARD W. FESSENDEN, *Professor of Chemistry*
RAY E. TORREY, *Professor of Botany*

Retirements:

ROLLIN H. BARRETT, *Professor of Farm Management*
ARTHUR I. BOURNE, *Research Professor of Entomology*
FAYETTE H. BRANCH, *Extension Professor of Agricultural Economics*
MAY E. FOLEY, *Extension Professor of Home Economics*
WELLESLEY C. HARRINGTON, *Extension Professor of Engineering*
WALTER O. JOHNSON, *Manager, Boarding Halls*
HORACE M. JONES, *Extension Professor, Head, Extension Division of Youth Work*
MRS. N. MAY LARSON, *Extension Professor of Home Economics*
ROY E. MOSER, *Extension Professor of Agricultural Economics*
GRUNOW O. OLESON, *Extension Professor of Communications*
ERNEST M. PARROTT, *Instructor in Chemistry*
FREDERICK S. TROY, *Professor of English*

Promotions:

To Dean:

MARY A. MAHER, *School of Nursing*
ALBERT W. PURVIS, *School of Education*

To Head of Department:

DORIC ALVIANI, *Music*
THEODORE C. CALDWELL, *History*
ARNOLD D. RHODES, *Forestry*
CLARENCE SHUTE, *Philosophy*

To Professor:

DONALD P. ALLAN, *Extension*
GEORGE W. CANNON, *Chemistry*
RICHARD M. COLWELL, *Business Administration*
BRADFORD D. CROSSMON, *Agricultural Economics*
ROBERT S. FELDMAN, *Psychology*
JAMES M. FERRIGNO, *Romance Languages*
ALBERT E. GOSS, *Psychology*
KARL N. HENDRICKSON, *Civil Engineering*
C. WENDELL KING, *Sociology*
WILLIAM H. LACHMAN, *Olericulture*
JOSEPH W. LANGFORD, *Electrical Engineering*
ARTHUR S. LEVINE, *Food Technology*
WARREN LITSKY, *Bacteriology*
HENRY N. LITTLE, *Chemistry*

William H. Ross, *Physics*
James G. Snedecor, *Physiology*
H. Leland Varley, *English*

To Associate Professor:
William B. Becker, *Entomology*
Matthew L. Blaisdell, *Farm*
Radie H. Bunn, *Communications*
Mrs. Gladys M. Cook, *Home Economics*
Helen F. Cullen, *Mathematics*
Irving S. Fagerson, *Food Technology*
William F. Field, *Psychology*
Robert A. Fitzpatrick, *Agricultural Economics*
George Goodwin, Jr., *Government*
Benton L. Hatch, *Library*
Marshall C. Howard, *Economics*
Robert P. Lane, *English*
Joseph S. Marcus, *Civil Engineering*
Charles F. Oliver, *Education*
Richard E. Pride, *Horticulture*
George R. Richason, Jr., *Chemistry*
John E. Roberts, *Chemistry*
H. Duncan Rollason, *Zoology*
Frank A. Singer, *Accounting*
Daniel Sobala, *Mechanical Engineering*
Arthur A. Socolow, *Geology and Mineralogy*
Richard S. Stein, *Chemistry*
George P. Weidmann, *Mechanical Engineering*
Sidney F. Wexler, *Romance Languages*
Raymond Wyman, *Education*
John K. Zeender, *History*

To Assistant Professor:
Donald K. Adams, *Education*
Luther A. Allen, *Government*
James S. Bosco, *Physical Education*
James W. Callahan, *Agricultural Economics*
Louis A. Carpino, *Chemistry*
Joseph Contino, *Music*
Richard F. Garber, *Physical Education*
Sarah L. Hawes, *Home Economics*
Walter Hopkins, *Mechanical Engineering*
E. Vickery Hubbard, *Physical Education for Women*
Elmar Jarvesoo, *Agricultural Economics*
Robert M. Kingdon, *History*
Stephen R. Kosakowski, *Physical Education*
Edward P. Larkin, *Public Health*
Earl J. McWhorter, *Chemistry*
John F. Manfredi, *Sociology*
Donald E. Moser, *Mathematics*
Henry B. Peirce, Jr., *Speech*
Maida L. Riggs, *Physical Education for Women*

Seymour Rudin, *English*
Mrs. Ann O. Trumbull, *Education*

To Instructor:
Donald Curtis, *Education*
Mrs. Bertha E. Fessenden, *Chemistry*
Mildred Pierpont, *Schedule*
Allen O. Sachs, *Guidance*

Appointments:

Theodore S. Bacon, Jr., *Visiting Lecturer in Landscape Architecture*
Miriam F. Fiedler, *Visiting Lecturer in Psychology*
James Gardner, *Visiting Lecturer in Landscape Architecture*
Lee E. Holt, *Visiting Lecturer in English*
John King, *Visiting Lecturer in Music*
Carroll J. Klett, *Visiting Lecturer in Psychology*
Donald F. McCaffrey, *Visiting Lecturer in Education*
Sidney Monas, *Visiting Lecturer in History*

To Director of Student Union:
William D. Scott

To Director of Bureau of Government Research:
John Gillespie

To Assistant Director of Bureau of Government Research:
Robert P. Bolan

To Head of Department:
John S. Harris, *Government*
H. T. U. Smith, *Geology and Mineralogy*

To Professor:
Walter G. O'Donnell, *Industrial Administration*

To Associate Professor:
Peter Heller, *German*
Maurice A. Unger, *Business Finance*
Harold G. Vatter, *Economics*

To Assistant Professor:
Woodbridge B. Brown, *Communications*
Norman G. Cournoyer, *Food Technology*
Edward P. Davis, *Armor*
Robert G. Drew-Bear, *Marketing*
Hans C. Duus, *Chemical Engineering*
David A. Evans, *Dairy and Animal Science*
John A. Fitzgerald, *Electrical Engineering*
Arthur C. Gentile, *Botany*
George R. Higgins, *Civil Engineering*
William A. Joyce, *Air Science*
Francis M. Kavanagh, *Air Science*

Winifred Kelly, *Nursing*
Marshall M. Levinson, *Economics*
Frank R. Longley, *Electrical Engineering*
George H. Lyttle, *Electrical Engineering*
Donald L. Mader, *Forestry*
Ralston B. Read, Jr., *Bacteriology*
Grant E. Rickard, *Air Science*
Jay Savereid, *Speech*
Howard D. Stidham, *Chemistry*
Robert D. Wilcox, *Armor*
Leland S. Wittwer, *Dairy and Animal Science*

To Instructor:
David D. Allen, *Olericulture*
Bansi Lal Amla, *Food Technology*
Mrs. Leone A. Barron, *English*
Peter C. Bazakas, *Geology*
David J. Beaubien, *Electrical Engineering*
Mrs. Sonya Bergquist, *Botany*
Frederick L. Bettelheim, *Chemistry*
John L. Blaisdell, *Agricultural Engineering*
Richard A. Blood, *Agricultural Economics*
William Bock, Jr., *Physical Education*
Mrs. Ruth C. Boicourt, *Home Economics*
Robert S. Bond, *Forestry*
Basil H. Bourque, *Agricultural Economics*
Morton M. Boyd, *Agricultural Engineering*
Boris Burak, *Speech*
Carl Campbell, *Economics*
Richard O. Carson, *Physics*
Louis E. Conhaim, *History*
Elaine Cook, *Mathematics*
Ana M. Cordones, *Romance Languages*
Mrs. Irene Davis, *Food Technology*
Harry W. Dodge, Jr., *Geology*
John G. Douglas, *Physical Education*
William Draper, *Food Technology*
Francoise M. DuParquet, *Romance Languages*
William H. Durfee, *Mathematics*
Leonard H. Ehrlich, *Philosophy*
Harvey F. Fisher, *Chemistry*
John M. Fitzgerald, *Business Administration*
Gladys Geiger, *Home Economics*
Charles L. Goldman, *Veterinary Science*
Irwin L. Goodchild, Jr., *Chemical Engineering*
Mary M. Goodwin, *Dairy and Animal Science*
Joseph B. Hampton, *Government*
Richard D. Harper, *Speech*
Roland F. Hess, Jr., *Physical Education*
Harry Jewusiak, *Electrical Engineering*
Miguel A. Jimenez, *Food Technology*
Robert K. Kinsey, *Economics*
Athanasios Kiratsous, *Agricultural Engineering*
Claire J. Landro, *Romance Languages*

Rene N. Larose, *Veterinary Science*
Robert J. Lavigne, *Entomology*
Deane Lee, *Agricultural Economics*
Herbert Levitt, *Psychology*
David W. Lewit, *Psychology*
Richard J. Libera, *Mathematics*
Harvey Lifton, *Psychology*
Mrs. Mary E. Marsden, *Home Economics*
Donald L. Maynard, *Olericulture*
Peggy Ann McConnell, *Dairy and Animal Science*
Mary E. McManamy, *Education*
Fresia Munoz, *Romance Languages*
Robert W. Murray, *Dairy and Animal Science*
Anand G. Naik-Kurade, *Food Technology*
Betty M. Navratil, *Mathematics*
Mrs. Clara K. Nicholson, *Agricultural Economics*
Neil L. Norcross, *Bacteriology*
Mrs. M. Jean O'Donnell, *English*
David F. Owen, Jr., *Feed and Fertilizers*
Alex Page, *English*
Donald A. Parks, *Geology*
Joseph A. Pavelcak, *Mathematics*
Erwin W. Pearson, *Forestry*
Mrs. Shirley L. Richards, *Feed and Fertilizers*
Joseph L. Sannella, *Chemistry*
Hira Singh, *Agricultural Economics*
Harold L. Smith, *Romance Languages*
Mrs. Elaine T. Smith, *English*
John H. Spencer, *Mechanical Engineering*
Victor E. Thomas, *Mathematics*
Donald H. Trahan, *Mathematics*
Everett E. Turner, Jr., *Chemistry*
Elizabeth Welt, *German*
Kathleen Williams, *Agricultural Communications*
James N. Ypsilantis, *Sociology*

Resignations:

Head of Department:
Julian M. Fore, *Agricultural Engineering*
Leonard R. Wilson, *Geology and Mineralogy*

Professor:
William E. Meehl, *Poultry Pathology*
Stanley Vance, *Business Administration*

Associate Professor:
Edward E. Anderson, *Food Technology*
Adolf E. Schroeder, *German*

Assistant Professor:
Robeson Bailey, *English*
Thomas A. Culbertson, *Food Technology*
David G. Damon, *Physical Education*
Richard M. Gillis, *Business Administration*

William Haller, Jr., *Economics*
John H. Karlson, *Electrical Engineering*
Donald M. Kinsman, *Farm*
Lowell E. Lingo, *Electrical Engineering*
Pericles C. Markakis, *Food Technology*
John W. Mastalerz, *Floriculture*
Robert J. McCartney, *University Editor*
Newton Y. Robinson, *Business Administration*
Norman J. Schoonmaker, *Mathematics*
Lawrence W. Sherman, Jr., *Business Administration*
Oddvar Solstad, *Chemical Engineering*
Mrs. Shirley S. Weeks, *Extension Home Economics*
Roger A. Wolcott, *Agricultural Communications*
Bertram G. Woodland, *Geology and Mineralogy*

Instructor:
Douglas Carmichael, *Philosophy*
Jeannette G. Davis, *Feed and Fertilizers*
Johannes Delphendahl, *Agricultural Economics*
Catherine A. Dower, *Education*
Leslie W. Fleming, *Veterinary Science*
Robert V. Ganley, *Forestry*
Albert S. Hill, *History*
W. Bradford Johnson, *Olericulture*
John E. Keegan, *Landscape Architecture*
James E. MacMonegle, Jr., *Physics*
Cyril M. Martin, *Food Technology*
Gunter H. Mattersdorff, *Economics*
Walter E. Mientka, *Mathematics*
Harvey A. Miller, *Botany*
Norton H. Nickerson, *Botany*
Philip R. Pearson, Jr., *Agronomy*
Ramon J. Rhine, *Psychology*
Grace Robertson, *Physical Education for Women*
Jean R. Rouge, *French*
Henry H. Scarborough, Jr., *Botany*
Edward H. Seadale, *Veterinary Science*
Alvin J. Simmons, *Psychology*
Robert F. Trocchi, *Electrical Engineering*
Everett E. Turner, Jr., *Chemistry*
Ana M. Veum, *Romance Languages*
Henry J. Walter, *Agronomy*
Mrs. Frances L. Warne, *Home Economics*
Lloyd P. Wheaton, *Chemistry*
Cecilia Welna, *Mathematics*

Leaves of Absence:
Frederick B. Chandler
David R. Clark
Katherine A. Clarke
Alton B. Cole
Byron E. Colby
J. Murray Elliot
Ralph L. France

Albert E. Goss
Richard Haven
Mildred L. Howell
J. Henry Korson
Guy R. Mermier
John W. Mohn
Bruce R. Morris
Otto P. Pflanze
Robert A. Potash
Sidney Schoeffler
Paul A. Swenson
Mrs. Emily P. Thies
Zina J. Tillona
Gilbert L. Woodside

The student distribution map prepared by staff and students at the University — Shannon McCune, Karl Hendrickson, Stuart Ball and Conrad Totman — employs a new formula for proportionate sizes of circles: the anti-log of 0.6 times the logarithm of the number. This is the first time this technique has been used on a printed map.

The concentration of mailing addresses in Amherst and vicinity is somewhat misleading. It includes a large number of veterans and married students whose parents' homes are elsewhere in the Commonwealth. They make their temporary homes in the vicinity of the University. The out-of-state students include seniors who were admitted before the policy of non-admission of out-of-state students was made and students whose parents have moved out of the Commonwealth after they were enrolled.

All but 36 towns in the state have students at the University. These towns are relatively small; in total they comprise less than one-half of one per cent of the population of the Commonwealth.

LAYOUT AND DESIGN
John Gillespie
Publications Office
University of Massachusetts

UNIVERSITY OF MASSACHUSETTS
AMHERST 1863
INDUCTUS PARERE DEORUM
QUIETEM

Bulletin

UNIVERSITY OF MASSACHUSETTS

Stockbridge School of Agriculture

1958-1960

The University of Massachusetts is both a State University and a Land Grant College and as such has been established by Acts of Congress and of the Legislature of Massachusetts.

The two year course in practical agriculture at the University of Massachusetts is known as the Stockbridge School of Agriculture, named after an early president of the University. Included herein are descriptions of the various courses offered, information concerning expenses, enrollment and regulations. In the back of the catalogue will be found forms for application and certification of citizenship.

The University reserves, for itself and its departments, the right to withdraw or change the announcements made in its catalogue.

UNIVERSITY BULLETIN
Amherst, Massachusetts

VOLUME XLXX NOVEMBER, 1957 NUMBER 4

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CALENDAR

1958

January

2—Thursday, 8:00 a.m. Classes begin.
15—Wednesday, 5:00 p.m. Classes stop.
16—Thursday through January 21, Tuesday. Final examinations.
27—Monday. Registration of freshmen.
28—Tuesday. Registration of seniors.
29—Wednesday, 8:00 a.m. Second semester begins.

February

22—Saturday. Holiday, Washington's Birthday

March

22—Saturday. Close of marks for mid-semester reports.
28—Friday. Monday classes will meet.
29—Saturday, 12:00 m. Second semester ends for freshman students except food management and forestry majors.
29—Saturday, 12:00 m. to April 8, Tuesday, 8:00 a.m. Spring recess.
31—Monday. Placement begins for freshmen.

April

8—Tuesday, 8:00 a.m. Classes begin.
19—Saturday. Holiday, Patriots' Day.

May

14—Wednesday, 5:00 p.m. Classes stop.
15—Thursday through May 21, Wednesday. Final examinations.
22-25—Thursday through Sunday. Commencement.

1958

September

9—Tuesday. Registration of senior forestry students.
15—Monday. Registration of freshmen.
16—Tuesday. Registration of seniors.
17—Wednesday, 8:00 a.m. Classes begin.

October

13—Monday. Holiday, Columbus Day.

November

8—Saturday. Close of marks for mid-semester reports.
11—Tuesday. Holiday, Veterans' Day.
25—Tuesday, 5:00 p.m. to December 1, Monday, 8:00 a.m. Thanksgiving recess.

December

20—Saturday, 12:00 m. to January 5, Monday, 8:00 a.m. Christmas recess.

1959

January

14—Wednesday, 5:00 p.m. Classes stop.
15—Thursday through January 20, Tuesday. Final examinations.
26—Monday. Registration of freshmen.
27—Tuesday. Registration of seniors.
28—Wednesday, 8:00. a.m. Classes begin.

February

23—Monday. Holiday, Washington's Birthday.
26—Thursday, 8:00 a.m. to 5:00 p.m. Monday classes will meet.

March

21—Saturday. Close of marks for mid-semester reports.
21—Saturday, 12:00 m. Second semester ends for freshmen except food management and forestry majors.
21—Saturday, 12:00 m. to March 31, Tuesday, 8:00 a.m. Spring recess.
23—Monday. Placement begins for freshmen.

April

20—Monday. Holiday, Patriots' Day.

May

20—Wednesday, 5:00 p.m. Classes stop.
21—Thursday to May 27, Wednesday. Final examinations.
28-31—Thursday through Sunday. Commencement

BOARD OF TRUSTEES

Lewis Perry, B.A., L.H.D. (Williams College), M.A. (Princeton University. Yale University), Litt. D. (Dartmouth College), L.H.D. (Amherst College, University of New Hampshire), LL.D. (Harvard University), Boston 1958

Rt. Rev. Msgr., Joseph H. Boutin, P.D., B.S.T., B.C.L. (Labal University), Gardner 1958

Dennis Michael Crowley, B.S., M.S. (University of Massachusetts), LL.B. (Boston College), Boston 1959

Francis Roland McDermott, A.B. (College of the Holy Cross), Wrentham 1959

Frank Learoyd Boyden, A.B., A.M. (Amherst College), A.M. (Williams College, Yale University), Sc. D. (Colgate University), Ph.D. (New York State College for Teachers), LL.D (Wesleyan University, Bowdoin College, Kenyon College, Harvard University, University of Massachusetts), L.H.D. (Amherst College, Williams College, Princeton University), Litt.D. (Tufts College), Deerfield 1960

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John William Haigis, M.A. (Amherst College), Greenfield 1961

Joseph Warren Bartlett, A.B. (Dartmouth College), LL.B. (Harvard University), LL.D. (University of Massachusetts), Boston 1962

Philip Ferry Whitmore, B.S. (University of Massachusetts), Sunderland 1962

William Michael Cashin, A.B. (Boston College), Milton 1963

Grace A. Buxton, A.B. (Smith College), LL.B. (Northeastern University), Worcester 1963

Ernest Hoftyzer, B.S. (Ohio State University) Wellesley 1964

Alden Chase Brett, B.S. (University of Massachusetts), Belmont 1964

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His Excellency Foster Furcolo, B.A., LL.B. (Yale University), Boston, Governor of the Commonwealth.

ean Paul Mather, B.S.C., M.B.A. (University of Denver), M.A. (Princeton University), LL.D (American International College, Amherst College). D.Sc. (Lowell Technological Institute), President of the University.

Owen B. Kiernan, B.S. (Bridgewater State Teachers College), Ed. M. (Boston University), Ed.D. (Harvard University), Commissioner of Education.

Charles Henry McNamara, Commissioner of Agriculture.

NEW BUILDING AND OCCUPANTS
. . . and more to come.

of significance to the entire faculty were accomplished this year. The changes were both ideological and material.

On July 27, 1956 the Governor signed the Freedom Bill, Chapter 556 of the General Laws. The new law provided extended freedom and autonomy to the Board of Trustees of the University in matters of hiring, promotion, demotion, salary determination and staffing pattern for the entire professional teaching, research, and officer administrative group. *Within appropriations*, this legislation gives the Trustees more autonomy and flexibility in personnel policy than they have exercised since 1924 and the original establishment of control by the state Division of Personnel and Standardization.

In the present competitive market for people of scientific, professional and special ability (for "men of ideas" if you will) any concept of rigidity and standardization is a sure guarantee of mediocrity in the long run. Great teachers, scientists, and engineers do not fit any system of controlled *minima* for either starting pay or continuing advancement. An intelligent democracy does not spend money or use resources, public or private, under such centralized absentee-control concepts.

Having "won the law" the University did not "lose

the legislature." Supplemental appropriations subsequent to passage of the Freedom Bill made possible more than fifty promotions in the teaching ranks and the hiring of several outstanding faculty members above previously established minimum salaries, and in appropriate ranks.

> *"The University of Massachusetts must be a peer and not a pawn in the great family of state universities now training the leaders and citizens of the nation and world of tomorrow."* From the 1955 President's Report.

Following closely upon the passage of the Freedom Bill the people of the University were again encouraged by a significant and morale-boosting salary increase. Recommended by the impartial professional management survey of Barrington Associates, this plan became legislation by General Court action, effective October 1, 1956. The University is sincerely grateful for the enactment of both the personnel and the salary legislation. Beyond gratitude, however, there is honest recognition of the responsibility each member of this institution now has to translate the effects of the legislation into a stronger faculty for a greater University — greater in quality as well as quantity. The opportunity is here for every individual to *grow*, under improving conditions of work, toward greater service than ever before to the students we train for a state, a nation, and a world life.

Growth For Our Students

The September 1956 enrollment figure of 4,516 represents a 10.3 per cent increase over the September 1953 total of 4,091. Applications for admission from in-state freshmen totaled 6,140. More than 1,000 additional applications were given out in the office of the Registrar, and 3,000 application requests were received from out-of-state. Applications finally returned from in-state freshmen numbered 4,012. *Only Massachusetts residents were accepted.*

After the standard College Entrance Board examinations were given to more than 2,500 of the final applicants or qualifying certificates were received from high school principals, a freshman class of 1,148 entered the University in September 1956. Some idea of the quality of these entrants may be gained from guidance evaluations showing the battery of entrance test averages compared with previously admitted classes. These averages show the upper 50 per cent of this 1956 entering class scored higher than the upper 25 per cent of the June 1956

THEODORE T. KOZLOWSKI, Ph.D. ..... Clark Hall
Professor of Botany and Head of Department

DONALD R. LAMBERT, M.S. ..... Chenoweth Laboratory
Instructor in Food Technology

EDWARD P. LARKIN, Ph.D. ..... Marshall Hall Annex
Assistant Professor of Bacteriology

DEANE LEE, B.S. ..... Draper Hall
Instructor in Agricultural Economics

ARTHUR S. LEVINE, Ph.D. ..... Chenoweth Laboratory
Associate Professor of Food Technology

ADRIAN H. LINDSEY, Ph.D. ..... Draper Hall
Professor of Agricultural Economics and Head of the Department of Agricultural Economics and Farm Management

WILLIAM P. MACCONNELL, M.F. ..... Conservation Building
Assistant Professor of Forestry

DONALD N. MAYNARD, M.S. ..... French Hall
Instructor in Vegetable Growing

HELEN S. MITCHELL, Ph.D. ..... Edna Skinner Hall
Dean of the School of Home Economics

RAYMOND H. OTTO, M.L.A. ..... Wilder Hall
Professor of Landscape Architecture and Head of Department

HENRY B. PEIRCE, JR., M.A. ..... Mathematics Building
Assistant Professor of Speech

EDWARD S. PIRA, B.S. ..... Stockbridge Hall
Instructor in Agricultural Engineering

FRANK E. POTTER, Ph.D. ..... Flint Laboratory
Assistant Professor of Dairy and Animal Science

ALFRED X. POWERS, M.Ed. ..... Stockbridge Hall
Instructor in Agricultural Engineering

PAUL N. PROCOPIO, M.S. ..... Wilder Hall
Assistant Professor of Landscape Architecture

ERNEST J. RADCLIFFE, M.D. ..... Infirmary
Senior Physician

ARNOLD D. RHODES, M.F. ..... Conservation Building
Professor of Forestry and Head of Department

J. HARRY RICH, M.F. ..... Conservation Building
Professor of Forestry

ELIOT C. ROBERTS, Ph.D. ..... Stockbridge Hall
Associate Professor of Agrostology

OLIVER C. ROBERTS, M.S. ..... French Hall
Associate Professor of Pomology

DONALD E. ROSS, B.S. ..... French Hall
Assistant Professor of Floriculture

FRANK R. SHAW, Ph.D. ..... Fernald Hall
Associate Professor of Entomology and Beekeeping

RUSSELL E. SMITH, D.V.M. ..... Paige Laboratory
Professor of Veterinary Science

J. ROBERT SMYTH, JR., Ph.D. ..... Stockbridge Hall
Associate Professor of Poultry Husbandry

GRANT B. SNYDER, M.S. ..... French Hall
Professor of Olericulture

RICHARD A. SOUTHWICK, M.S. ..... Stockbridge Hall
Instructor in Agronomy

HERBERT G. SPINDLER, M.B.A. ..... Draper Hall
Assistant Professor of Agricultural Economics

HARVEY L. SWEETMAN, Ph.D. ..... Fernald Hall
Professor of Entomology

WILLIAM H. TAGUE, B.S. ..... Stockbridge Hall
Assistant Professor of Agricultural Engineering

REUBEN E. TRIPPENSEE, Ph.D. ..... Conservation Building
Professor of Wildlife Management

JOSEPH TROLL, M.S. ..... Stockbridge Hall
Instructor in Agrostology

ALDEN P. TUTTLE. M.S. ..... French Hall
Assistant Professor of Vegetable Growing

JOHN H. VONDELL ..... Stockbridge Hall
Associate Professor of Poultry Husbandry

JOHN A. WEIDHAAS, JR., M.S. ..... Fernald Hall
Instructor in Entomology

KAROL S. WISNIESKI, M.P.H. ..... Marshall Hall Annex
Instructor in Bacteriology

JOHN M. ZAK, M.S. ..... Stockbridge Hall
Assistant Professor of Agronomy

this School offers extended opportunity for a strong teacher training program. The responsibility of the University in this field is obviously a function of the greatest single problem in education at all levels, now and in the future. Need for teachers in a situation that is already "short supply" represents a first things first approach to a matter of public policy and necessity.

Growth of Facilities

"To every thing there is a season, and a time to every purpose under heaven
. . . a time to build up
. . . a time to gather stones together."
Ecclesiastes 3

Undergraduate classes and a majority of faculty offices were transferred out of the obsolete and fire hazardous quarters of the old Mathematics building, the Liberal Arts Annex, and North College in October 1956. Faculty and students moved into beautiful new Machmer Hall, the emergency classroom building provided by an appropriation of $1,000,000 in 1954. Shortly afterward construction began on the $1,871,000 Women's Physical Education Building. Nearing completion also at the close of the year was the large animal disease laboratory — a $50,000 gift from Red Acre Farms, Inc.

Nearing completion and planned to open on February 1, 1957, the $2,000,000 Student Union represents the tangible growth of intangible dreams for a cultural, recreational, organizational center for the extra curricular life of the entire student body. The Union is being amortized by a student fee which spells out tangibly the continuing policy of assessing rental, food, and recreational costs *outside* the regular public budget of the University.

A welcome Christmas season transfer of $786,000 of special state funds to allow awarding of construction contracts to begin the new Public Health Building and the Chemistry Building brought capital outlay appropriations for the past three years to a total of $12,125,000. This physical growth factor represents an average annual appropriation of over four million dollars and a total appropriation $3,425,000 in excess of the previously accumulated 91 years at cost of all state funds provided for capital outlay. More than 80 per cent of these facilities are in the Arts and Science and general education area — the basic first two years of the program.

A second annual appropriation of $100,000 in capital outlay for equipment allows for replacement of the *obsolete* and purchase of the *up-to-date* in the laboratories and classrooms of the entire campus.

Faculty and student morale, competitive stamina, standards, and general reputation all *grow* with these quantitative and material facility-requisites for the quality of a modern and progressive university.

Growth in a World Context

> *"At the beginning of the year 1876 the Trustees were called to perform a most unexpected, but most important, duty in connection with agricultural education. The Japanese Government having determined to establish an agricultural college, and having selected the Massachusetts College as a model, very naturally looked to its faculty and graduates for advice and assistance."* From the Annual Report, January 1878.

During the year the University was invited by the International Cooperation Administration to send a survey team to the University of Hokkaido, Sapporo, Japan, to negotiate a contract between the two universities for the purpose of exchanging technical professional personnel in the field of agriculture. A memorandum of agreement has been signed by the presidents of the two institutions renewing the relationships of 80 years' standing, and recalling that the first exchange of professional personnel in 1876 under the leadership of Dr. W. S. Clark resulted in 15 Americans from Massachusetts Agricultural College serving at the University of Hokkaido and contributing substantially to the agriculture of that island. When these professors returned to America they brought with them many important crops. Two — Japanese millet and the soy bean — have become domestic crops of significance here in America.

In this renewal of relationships between the two universities, it is proposed that a contract be drawn between the University of Massachusetts and the International Cooperation Administration to support a program that will call for the training of nine Japanese professors each year at the University of Massachusetts and the initiation of research, extension, and teaching at the University of Hokkaido in the fields of forage crop management, agricultural marketing, food technology, poultry science, and home economics in a phased program over a period of four years. The choice of the University of Massachusetts by the University of Hokkaido for this exchange is evidence of the world reputation enjoyed by persons trained in agriculture at Massachusetts and the im-

A student who has completed two semesters of the Stockbridge School course shall be granted 10 credits.

A student who has completed one semester of Stockbridge School work shall be granted 5 credits.

A student who has completed three semesters of work in the Stockbridge School should complete his course before transferring to the four year course.

A Stockbridge School student who has satisfactorily completed his period of placement training will have satisfied this requirement of a department in a four-year major if this major is closely related to his Stockbridge School major. Otherwise, the head of the department will determine whether placement training for the four-year course is to be required.

Graduation Requirements.—No student will be graduated unless all bills due the University are paid on or before the Wednesday preceding graduation exercises.

Diplomas and letters of honorable dismissal will be withheld from all students who have not paid bills due to the University, or legitimate bills due private individuals or business concerns.

A diploma will not be awarded to any senior if arrears are reported by his fraternity. All bills for second semester, senior year, must be settled not later than the Wednesday before graduation.

Attendance at graduation exercises is required of all seniors before diploma will be awarded.

Seniors who have borrowed from the Goldthwait Loan Fund will have diplomas held as collateral by the University until they have paid up loans in full. This in no way interferes with the privileges of graduation.

Scholarship Regulations.—At the close of each semester students receive a formal report showing the standings given in the subjects pursued by them.

If a student's average in any subject is below D, he is failed (F) in the course and must repeat it with the following class.

The instructor has the privilege of turning in a condition (#) mark which allows the student to repeat the final examination with the hope of receiving a passing grade. The instructor also has the privilege of turning in a withheld (wh) mark in case a student has not turned in all required work.

Students will be graded by instructors at mid-semester to show general standing and at end of semester for permanent record. The Faculty Advisory Committee will consider all questionable grades after each marking period, and when a student's scholastic record indicates failures or uniformly poor work, may recommend close supervision of his class work by the major department concerned, or that he be asked to withdraw from school.

A first-year student will not be eligible for placement training if in the opinion of his major department his scholastic work has not been satisfactory.

At the end of any semester a student who has failed in two courses, or has conditions in more than two courses, is dismissed. A student failing a course in his major department may or may not be dismissed depending on the recommendation of his major department.

Rules and Regulations

Absences from Class

(1) Attendance at all lectures, laboratories, and class trips is expected of all students.

(2) Each instructor will establish his own attendance rules and the director will support whatever rules are established.

(3) All students are required to report promptly to University infirmary, if ill, and condition permits. Bring doctor's statement for absence excuse if treated elsewhere.

Student Expenses

Tuition.—A tuition fee of $50 per semester is charged students, residents of Massachusetts, enrolled in the Stockbridge School of Agriculture. Students who are not residents of Massachusetts are charged a tuition of $300 each semester. The tuition per semester, charged persons not citizens of the United States is $300. Students entering from Massachusetts, unless of voting age themselves, are required to file a statement signed by either town or city clerk, stating that the applicant's parent is a legal resident of Massachusetts. (See Form II in back of catalog.)

Variation in Course Charges:

Food management and forestry courses:—Placement jobs are not available until after June 1, and students have to complete two semesters of resident study each year. Students majoring in these two programs of work pay full semester fees both the first and second years as indicated in the following table.

Summary of Expenses Estimated:

	FIRST YEAR	SECOND YEAR
Tuition (Citizens of Mass.)	$ 75.00 - $100.00	$100.00
Room in University Dormitory	135.00 - 175.00	175.00
Board at University Commons (5-day week)	235.00 - 292.00	292.00
Books, stationery, and other supplies	90.00 - 90.00	90.00
Athletic Fee	15.00 - 20.00	20.00
Student Union Fee	15.00 - 20.00	20.00
*Student Taxes	18.65 - 19.15	21.15
	$583.65 - $716.15	$718.15

These figures for board and room are estimates based on prevailing prices and may be subject to change.

***Student Taxes:**

	FIRST YEAR	SECOND YEAR
Class Tax	$2.00	$2.00
Collegian	1.90 - $2.40	2.40
Concert Tax	3.00	3.00
Identification Fee	1.00	1.00
Shorthorn (School Yearbook)	7.00	10.00
Stockbridge School Activities	3.00	2.00
Student Handbook	.75	.75
	$18.65 - $19.15	$21.15

Estimated cost of required field trips during the two years, $15.00 - $50.00.

pact of the influence that Dr. Clark had on the Japanese when he was there 80 years ago.

This program as it develops will not only bring the University prestige and recognition but represents practical, educational, and spiritual growth evidencing responsibility to the world as well as the local scene.

> *"It is fifty years since the departure of President Clark, but our admiration for him has increased with the years, and the words dropped here and there by our great master seem to guide us till the ages come."* Shosuke Sato, member of the first graduating class and three times President of Hokkaido University, at a celebration in 1926.

Growth for the Future

> *". . . of faith in the future of a state university second to none; of sanguine hope and strong optimism that the people of Massachusetts and their duly elected representatives will continue to develop higher education as the greatest bulwark of democracy and progress."* From the 1954 President's Report.

Maturity is also a state of vision, and vision that is not just visionary. Horizons practical and idealistic are tomorrow's successful translation of sound planning for today. The University master plan for the next ten years in terms of plant and physical growth was completed in 1956 with funds from the state Division of Building Construction. With the blueprint laid and projections completed for facilities to accommodate 10,000 students in 1965, it is essential that constructive planning for maximum educational performance and service for each tax dollar expended be the immediate goal.

As an example of the forward planning, we are preparing a vital, effective summer program at the University. This administration does not believe that the present curricular program involving a short six week summer session is efficient, realistic, or educationally sound for the years ahead in terms of the population and service demands of our expanding and progressive economy. With the exception of research and extension programs in agriculture, and individual or contract research in other fields, the plant, facilities, and professional staff of the University are in large part idle from late in May to the first of July and again from the second week in August to the last week in September. The present summer teaching program (outside the engineering surveying courses typical of all engineering school opera-

tions) is primarily a make-up and teacher training activity in which only a part of the staff and facilities are used. During the relatively idle periods mentioned the University is costing the taxpayers of the Commonwealth in excess of $17,000 per day with considerably less than proportionate returns. This comment is not related to business efficiency terms only.

What is contemplated is a budget proposal to be submitted for 1958 that envisions a modest increase in staff expenditure for a more than proportionate utilization of physical and manpower resources. Such policy does not destroy vacation or change of experience possibilities for staff. Rather it embodies additional staff and additional staff funds to allow *all who desire* to teach here in the summer, as well as staff from other universities seeking a quarter or semester of change in other environs, to make the University of Massachusetts a year-round educational center. Anything short of such a program is an inefficient use of public funds and an unrealistic answer to pressing future demands.

Accordingly, through proper committees and staff discussions the curriculum and schedule can be rearranged during the coming year to allow for such an extension of program *provided the extra summer*

STUDENT UNION
Growth of Facilities

Prospective students should understand that the above estimates cover expenses which may be called strictly University expenses, and that there are other financial obligations voluntarily assumed by students which they should expect to meet. Such expenses vary from $40 to $50 a year. Additional financial responsibility is also assumed by students joining fraternities or entering into other social activities of the University. Besides the amount necessary for clothes and traveling, the economical student will probably spend between $700 and $800 for the first year for one and one-half semesters in residence, and $900-$1,000 for the second year of two semesters.

Student Employment Projects

Part-time work is available for a limited number of needy students. The type of work to which students may be assigned is as follows: Clerical and office; building and grounds maintenance; farm, greenhouse and orchard duties; helpers in livestock and cattle barns, and other miscellaneous jobs.

Self Help.—The University does not encourage students to enter without money in the expectation of earning their way entirely. The student will find it better to work and accumulate sufficient funds before coming to the University, or else to take more than two years in completing his course.

No student should undertake work that interferes with his studies, and students should understand that no one may receive any large amount of work at the University.

First year students particularly should not risk failure by taking on such extra work until they have, at least, tested themselves in the study program of the first semester. It is advised to proceed cautiously in combining both extra work and athletics at the same time, if the student's scholastic record is at all questionable.

Loans

Bartlett Loan Fund.—This fund was given to the Stockbridge School by the F. A. Bartlett Tree Expert Company of Stamford, Conn. This fund is available only to students majoring in arboriculture and is handled in a manner similar to the one used in administering the Stockbridge Emergency Loan Fund.

The Vincent Goldthwait Loan Fund.—This fund was established by Dr. Joel E. Goldthwait, U. of M. 1885, of Boston, as a memorial to his son who died in 1922 during his junior year at Harvard. Its purpose is to aid worthy students in financial difficulties. Amounts in excess of $200. are rarely granted and most loans range from $50. to $150.

A regular promissory note must be executed, endorsed by parent or guardian, and repayment may be made within any reasonable period after graduation up to one year. There is no interest charge.

Stockbridge Emergency Loan Fund.—This fund was started by the Class of 1951 and added to by the Classes of 1952, 1953, 1955, 1956 and 1957 as their commencement gifts to the school. It provides immediate loans for short periods of time, one week to one month usually, to any student who finds his funds running short or has an emergency expense not anticipated. These are temporary loans without interest charge to meet emergency situations only, developing during the school year.

All requests for such aid should be made in person to the Director of Short Courses who issues the necessary order to the treasurer's office.

Scholarships

Prospective senior students should file scholarship applications before starting placement training in the spring. First-year students will receive a scholarship application blank when notified of their acceptance. This application should be filed within one month after its receipt.

Ascension Farm School Scholarships.—Trust funds from the Ascension Farm School Corporation of Great Barrington were given to the University trustees in 1952 the income from which shall be used to provide for the "education and training in agriculture of boys resident in Western Massachusetts," as stated in its original charter. This makes possible the award of scholarships to men students residing in Hampden, Hampshire, Franklin, and Berkshire counties with special consideration to be given applicants from the last named county.

The Margaret Fitz Barnes Scholarship.—A $100 scholarship awarded annually to a young man or young woman interested in landscape operations who is in need of financial aid and has been accepted or is enrolled in the Stockbridge School of Agriculture.

The Boston Market Gardeners Association Scholarship.—An annual scholarship of $100 to be awarded to a deserving student majoring in vegetable crops. This scholarship may be awarded either to a four year or Stockbridge student.

The Cape Cod Farm Bureau Scholarship.—An annual $50 scholarship to a student of agriculture at the University who may be taking either Stockbridge or four year course.

Lotta Crabtree Scholarships.—By special arrangement with the Lotta Crabtree Foundation trustees of Boston, a number of scholarships are available to Stockbridge students.

The Holbrook Garden Club Scholarship.—An annual scholarship of $100 to be awarded to a Stockbridge student who has graduated from a Norfolk County high school. Preference is given to a Holbrook High School graduate or resident who is recommended by the high school principal and approved by the Holbrook Garden Club awards committee.

Holyoke and Northampton Florists' and Gardeners' Club Scholarship.—An annual scholarship of $100 to be awarded to a senior student (man or woman) in the Stockbridge School who is majoring in floriculture or landscape operations.

The V. A. Rice Scholarship Fund.—A $100 scholarship for a worthy student majoring in animal husbandry—either Stockbridge or four year.

Wilbur H. H. Ward Scholarships.—The Wilbur H. H. Ward Fund is administered by a board of trustees independent of the university. Applicants for these scholarships should write to Sumner R. Parker, who may be addressed at 1 Sunset Court, Amherst, Mass. They are available only to Hampshire County boys.

William H. Ross, *Physics*
James G. Snedecor, *Physiology*
H. Leland Varley, *English*

To Associate Professor:
William B. Becker, *Entomology*
Matthew L. Blaisdell, *Farm*
Radie H. Bunn, *Communications*
Mrs. Gladys M. Cook, *Home Economics*
Helen F. Cullen, *Mathematics*
Irving S. Fagerson, *Food Technology*
William F. Field, *Psychology*
Robert A. Fitzpatrick, *Agricultural Economics*
George Goodwin, Jr., *Government*
Benton L. Hatch, *Library*
Marshall C. Howard, *Economics*
Robert P. Lane, *English*
Joseph S. Marcus, *Civil Engineering*
Charles F. Oliver, *Education*
Richard E. Pride, *Horticulture*
George R. Richason, Jr., *Chemistry*
John E. Roberts, *Chemistry*
H. Duncan Rollason, *Zoology*
Frank A. Singer, *Accounting*
Daniel Sobala, *Mechanical Engineering*
Arthur A. Socolow, *Geology and Mineralogy*
Richard S. Stein, *Chemistry*
George P. Weidmann, *Mechanical Engineering*
Sidney F. Wexler, *Romance Languages*
Raymond Wyman, *Education*
John K. Zeender, *History*

To Assistant Professor:
Donald K. Adams, *Education*
Luther A. Allen, *Government*
James S. Bosco, *Physical Education*
James W. Callahan, *Agricultural Economics*
Louis A. Carpino, *Chemistry*
Joseph Contino, *Music*
Richard F. Garber, *Physical Education*
Sarah L. Hawes, *Home Economics*
Walter Hopkins, *Mechanical Engineering*
E. Vickery Hubbard, *Physical Education for Women*
Elmar Jarvesoo, *Agricultural Economics*
Robert M. Kingdon, *History*
Stephen R. Kosakowski, *Physical Education*
Edward P. Larkin, *Public Health*
Earl J. McWhorter, *Chemistry*
John F. Manfredi, *Sociology*
Donald E. Moser, *Mathematics*
Henry B. Peirce, Jr., *Speech*
Maida L. Riggs, *Physical Education for Women*

Seymour Rudin, *English*
Mrs. Ann O. Trumbull, *Education*

To Instructor:
Donald Curtis, *Education*
Mrs. Bertha E. Fessenden, *Chemistry*
Mildred Pierpont, *Schedule*
Allen O. Sachs, *Guidance*

Appointments:

Theodore S. Bacon, Jr., *Visiting Lecturer in Landscape Architecture*
Miriam F. Fiedler, *Visiting Lecturer in Psychology*
James Gardner, *Visiting Lecturer in Landscape Architecture*
Lee E. Holt, *Visiting Lecturer in English*
John King, *Visiting Lecturer in Music*
Carroll J. Klett, *Visiting Lecturer in Psychology*
Donald F. McCaffrey, *Visiting Lecturer in Education*
Sidney Monas, *Visiting Lecturer in History*

To Director of Student Union:
William D. Scott

To Director of Bureau of Government Research:
John Gillespie

To Assistant Director of Bureau of Government Research:
Robert P. Bolan

To Head of Department:
John S. Harris, *Government*
H. T. U. Smith, *Geology and Mineralogy*

To Professor:
Walter G. O'Donnell, *Industrial Administration*

To Associate Professor:
Peter Heller, *German*
Maurice A. Unger, *Business Finance*
Harold G. Vatter, *Economics*

To Assistant Professor:
Woodbridge B. Brown, *Communications*
Norman G. Cournoyer, *Food Technology*
Edward P. Davis, *Armor*
Robert G. Drew-Bear, *Marketing*
Hans C. Duus, *Chemical Engineering*
David A. Evans, *Dairy and Animal Science*
John A. Fitzgerald, *Electrical Engineering*
Arthur C. Gentile, *Botany*
George R. Higgins, *Civil Engineering*
William A. Joyce, *Air Science*
Francis M. Kavanagh, *Air Science*

(2) The Student Health Service physicians have offices in the out-patient Infirmary Building, where they may be consulted during college hours.

(3) The Infirmary consists of three buildings, one for bed patients, one for contagious cases, and one for out-patient cases, where the out-patient clinic is conducted daily by one of the student Health Service physicians.

(4) The students are urged to consult the resident physicians at the first sign of physical disorder, or even for minor accidents. Many severe illnesses and much lost time may be avoided by early or preventive treatment.

(5) House calls cannot be made to dormitories, private homes, or fraternities except in the case of emergency. The University cannot assure each student that a resident physician will always be available. In such instances students are encouraged to consult a town physician, although any expense connected with such service shall be borne entirely by the student. One resident physician is on call at all times to care for emergencies beyond the scope of the nurse on duty.

(6) No charge is made to infirmary bed patients up to seven days in each school year; time in excess of seven days will be charged at the rate of $4 per day. A nominal charge may be made to out-patients for miscellaneous treatments.

(7) In addition to the fee charged as specified in paragraph six the following additional expenses will be charged to the patient.

(a) *Nurses.*—If a special nurse is required for the proper care of an individual, the services and board of this nurse will be paid by the patient. Such a nurse will be under the general supervision of the resident nurse.

(b) *Professional Service.*—If a student requires continuous medical attention by a physician, he may be required to select a town physician and become responsible for fees charged by that physician.

(c) *Supplies.*—Special medical supplies prescribed by a physician will be charged to the patient.

(d) *Laundry.*—Expenses for personal laundry incurred by students while in the infirmary will be charged to the individual student.

(8) The Health Service recommends strongly that students participate in the blanket insurance program described in literature accompanying the initial bill rendered students each year. This program is a reimbursement insurance plan providing medical, surgical, and hospital care for both accidents and illnesses at a very low cost. During the past years this plan has saved numerous patients from serious unexpected expenses and the insurance payments have enabled the students to stay in school. The University has no financial interest in this and acts only as a clearing house to receive premiums, in order to give the low group rate.

Goodell Library

The Goodell Library forms the central unit of the University library and contains the largest portion of the book collections of the University numbering 206,727 books and periodicals. A central card catalog lists all books to

be found in the University. The agricultural and scientific collections are especially strong in the literature of entomology, botany, chemistry, horticulture, land architecture, soil science and animal husbandry. In addition there are extensive collections in literature, history, economics and sociology. There are over 850 current periodical titles (popular, literary, and scientific) subscribed to by the library. The publications of the several state agricultural experiment stations are well represented in the collections. The library is also a depository for a large portion of the publications of the United States Government including Department of Agriculture publications.

The library hours during regular term time are Mondays through Fridays 8:00 A.M. to 10:00 P.M.; Saturdays, 8:00 A.M. to 12:30 P.M., and Sundays and holidays, 2:00 P.M. to 10:00 P.M.

Goodell Library is named in memory of Henry Hill Goodell, president of the University from 1886 to 1904 and librarian from 1886 to 1898.

Agricultural Opportunities for Women

Agriculture is a field in which women have always found some opportunity. There are women farming independently in all branches of agriculture. They are engaged in poultry raising, small fruits, vegetable growing, floriculture and a more limited number in dairy, stock, and general farming. Wholesale and retail florists offer opportunities for employment.

For the woman or girl whose home is already upon the farm the opportunity is better. With the help of an agricultural education there are open to her many means of increasing her own or the farm income. With the knowledge of farm life which she already possesses, and with the possibility of securing occasional help from her family, she may be able to carry on and develop profitable enterprise of her own. The Stockbridge School of Agriculture offers to the women who wish to engage in farming the practical training which they will need to fit for such work.

Positions

The University does not guarantee positions to students registered in any of its courses, but through the Placement Service it has an opportunity to recommend students for a large number of positions. A record is kept of each student's work and experience, and of his success in positions for which he has been recommended after he has finished his course. Opportunities for trained men and women, especially those who have had experience, are good.

A student desiring a recommendation from the University must meet the following conditions:—

(1) He must be of good character.
(2) His previous record must be good.
(3) His work in all courses must be satisfactory.

Students who have not previously had a considerable amount of practical experience cannot, as a rule, be recommended for positions of responsibility. This is especially true of the better positions for which managers or superintendents are wanted.

Vocational Placement

The work of locating first-year students for apprentice training from April to October, after the resident term is completed, is in charge of the Director of Placement Service. Placement training for women students is in charge of the Placement Officer for Women. Every effort is made to secure satisfactory positions affording the kind of training desired by the student, but the Placement Office cannot guarantee to place every student for training, when positions are not available. In normal times placement positions are secured for all students who are eligible under these conditions.

1. Positions are secured that will enable a student to gain practical experience in his particular vocation.

2. A student desiring placement at home may arrange for such assignment if the Director of Placement approves. As a rule, it will be found more desirable for a student to spend this six months away from home even though he plans to be employed there after finishing the course. This statement is based on the experience of students who have already taken the course. The parent must request in writing, placement on the home project.

3. If credit is to be secured for the six months' placement training the following rules must be carefully observed.

Rules for Stockbridge Students on Placement

1. The student must interview the director of placement early in his first year in order that his qualifications, the type of work he wishes to pursue, and his general fitness may be determined.

2. No final arrangement for placement training may be made by the student himself until the Director of Placement has been consulted.

3. Students are required to complete their period of training without unnecessary absences.

4. No transfers are to be made by a student if he is to receive credit, until permission has been obtained from the Director of Placement.

5. A position may not be given up by the student until the Director of Placement has been notified.

6. A monthly report must be furnished on the form supplied, and submitted not later than the fifth of each month during his training period.

7. Students must satisfactorily complete all reports as required by the various departments.

8. When a student fails to complete the requirements of his placement training with a satisfactory grade, he is not allowed to take the work of the second year.

9. All students are required to submit a report of physical examination at time of registration. Any disabilities liable to affect the student's placement work are noted, and, if of a serious nature, recommendations for corrective measures are supplied. Parents should understand that most kinds of agricultural work require a well-balanced combination of brawn and brain. No student whose physical condition is questionable will be accepted for placement training without a physician's certificate, and parents' approval.

It should be clearly understood by both employer and employee that the same energy, regularity and general conduct will be expected of the student during his period of placement training as is expected in his work in classes and on the campus.

It should also be noted that this six months' experience is educational in its nature. Students are expected to earn and receive a reasonable wage, but the purpose of the training is the experience gained rather than the wage earned. The scale of wages may vary in different localities, but each man's ability is given very careful thought, that he may obtain a wage that is fair to him. In the event of any misunderstanding the supervisor should be immediately informed.

ANIMAL HUSBANDRY

Professor Hankinson, Professor Foley, Assistant Professor Elliot, Assistant Professor Baker, Mr. Buck

A major program of study in the Department of Dairy and Animal Science.

Animal Husbandry in this School, refers to the breeding, feeding and management of dairy cattle, beef cattle, horses, sheep and swine.

The purposes of the curriculum in animal husbandry are (1) to provide the student with a thorough understanding of the basic principles involved in the development of more efficient, productive and useful animals:—these principles are those involved in the biology of animal reproduction, the chemistry of animal growth and nutrition, and the economics of livestock production; (2) to show the practical workings of these principles in the selection, feeding and management of the various classes of livestock and (3) to provide practice in judging, fitting, showing and general management of livestock as well as the production of milk and other products, and the slaughtering, curing and marketing of meat products.

The University dairy herd comprises about 150 animals in the Ayrshire, Guernsey, Holstein and Jersey breeds. In beef cattle, a herd of Aberdeen-Angus and a herd of Herefords are maintained; in sheep, flocks of Shropshires and Suffolks; in swine, a herd of Chester Whites; and in horses, a small band of Morgans. Modern barns house the animals and modern equipment is available for practice work.

The University Farm of about 200 acres is handled primarily as a livestock farm, producing pasture, hays and silages for livestock feeding. The farm is equipped with up-to-date machinery for agricultural production. The farm and barns, animals and accessories comprise the laboratory facilities.

The Charles H. Hood Dairy Foundation Prize for Animal Husbandry Seniors.

The Charles H. Hood Dairy Foundation Prize of $200 is awarded annually to seniors who in the judgment of a faculty committee have made an outstanding scholastic record in this major course and who because of their practical qualifications, personality, and character, seem best qualified to receive this honor.

JOB OPPORTUNITIES:

Owners and operators of dairy farms; farm managers; superintendents or foremen; herdsmen in various kinds of livestock enterprises; dairy herd association testers; inseminators in artificial breeding units; businesses allied to agriculture such as farm cooperative fieldmen, sales and service men for feed, fertilizer and farm machinery companies.

Animal Husbandry

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Economics S3 (Marketing)
Agronomy S1 (Soil Management)
Animal Husbandry S1 (Principles of Feeding)
Bacteriology S1 (Bacteriology and Rural Hygiene)
Dairy Technology S1 (General Dairying)
Farm Management S1 (Introductory Course)
Milking (Practice periods only, by arrangement)

Elective

Physical Education S1 (Football)

Second Semester

(Eight Weeks Resident Instruction followed by Six Months Placement Training)
Agricultural Engineering S-4 (Farm Shop)
Agronomy S-2 (Fertilizers)
Animal Husbandry S-2 (Types and Breeds)
Fruit Growing S-10 (General Course)
Poultry Husbandry S-10 (General Course)

Elective

Physical Education S-4 (Basketball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S-1 (Farm Power)
Animal Husbandry S-3 (Animal Breeding)
Animal Husbandry S-5 (Farm Meats)
Business English S-1
Farm Management S-3 (Advanced Course)
Public Speaking S-1
Veterinary Science S-1 (Animal Sanitary Science)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S-10 (Farm Structures and Drainage)
Agronomy S-4 (Field Crops)
Animal Husbandry S-4 (Livestock Production)
Animal Husbandry S-6 (Dairy Cattle and Milk Production)
Public Speaking S-2

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Animal Husbandry S-1. (Principles of Feeding) I.

Includes a study of the organs of digestion, the digestion and absorption of feeds, the classification and characteristics of the common feed-stuffs, the utilization of feeds in maintenance, growth, work, fattening, meat production and milk production. Some time will be spent on the importance of minerals and vitamins. Methods of calculating balanced rations, feeding standards, and feeding practices will be studied. A visit to a feed mill is a requirement of this course.

Textbooks: Morrison, "Feeds and Feeding."

4 class hours and 1 2-hour laboratory period a week. Credit, 5.

Mr. Elliot.

Animal Husbandry S-2. (Types and Breeds) II.

Considers the origin, history, development, characteristics and distribution of the breeds of cattle, sheep, swine and horses commercially important in the United States. The conditions to which each class of livestock and each breed seem best adapted will be discussed. Laboratory work consists of judging and evaluating as many rings of dairy, beef cattle, sheep, swine and horses as time permits.

3 class hours and 2 2-hour laboratory periods a week. Credit, 5.

Mr. Elliot.

Animal Husbandry S-3. (Animal Breeding) I.

Planned to acquaint the student with reproductive physiology and genetics, and to show how such knowledge may be utilized through genetic analyses, selection, and systems of breeding for the development of more efficient, productive and useful animals. A field trip is made to the Massachusetts Selective Breeding Association. Textbook: Rice, Andrew and Warwick, "Breeding Better Livestock."

3 class hours and 2 2-hour laboratory periods a week. Credit, 5.

Mr. Baker.

Animal Husbandry S-4. (Livestock Production) II.

Deals briefly with the problems of selection, breeding and care of horses beef cattle, sheep, and swine, with emphasis on their place in New England Agriculture. Attention is given to the general situation, equipment, feeding, and management problems. The laboratory periods, consist of practice in fitting and showing, shearing, docking and castrating. As a part of the laboratory work, each student will be assigned an animal for fitting and showing in the "Little International" which will be held on a Saturday in March. Trips to other purebred livestock establishments in New England will be required during the semester. The cost of transportation will not exceed $5. Four students in this course will be selected to participate in the New England two-year school judging contest. Textbook: Ensminger, "Animal Science."

Prerequisites: Animal Husbandry S1 and Animal Husbandry S2.

3 class hours, 1 2-hour and 1 4-hour laboratory periods a week and trips.

Credit, 5.

The Department.

Animal Husbandry S-5. (Farm Meats) I.

Includes a survey of the packing industry and follows the product (i.e., beef, pork, lamb and veal) from the feed-lot to the consumer's table. Practice is afforded in classifying animals as to market class and grade and in slaughtering, dressing, and cutting beef, pork, lamb and veal. At the end of the course, a one day trip will be taken to several large packing houses in Boston at a cost of about $10. Textbook: Ziegler, "The Meat We Eat."

Special equipment needed for this course includes knives, boots and wash suits, estimated cost, $15.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

The Department.

Animal Husbandry S-6. (Dairy Cattle and Milk Production) II.

Treats all phases of dairy cattle production and management. The student is provided with an opportunity to study and seek the solution to the various economic, nutritional, genetic and managerial problems concerned in successful dairying. Lectures will be supplemented with talks by specialists. Laboratory will consist of a detailed study of methods used on the University farm, with practice in the various skills necessary for the herdsman or showman. A dairy cattle judging team will represent the Stockbridge School of Agriculture in the New England two-year school judging contest. Special judging laboratories will be scheduled to train this team.

Inspection trips to purebred livestock farms will be required during the spring semester. The cost for transportation will not exceed $15. Textbook: "Dairy Cattle Feeding and Management." Henderson and Reaves.
3 class hours and 2 2-hour laboratory periods a week. Credit, 5.
Mr. Foley.

Animal Husbandry S-8. (Food Management Meats) II.
For majors in the food management course. This course covers fundamental principles involved in judging, purchasing and efficiently utilizing meat and meat products. Laboratories will involve actual slaughtering, dressing, wholesale and retail cutting and preparation of by-products. Judging practice will be secured in a nearby packer cooler, and at the end of the course a one-day trip costing $10 will be scheduled to several large packing houses in Boston. Textbook: Ziegler, "The Meat We Eat." Special equipment needed for this course includes knives, boots, and wash suits—estimated cost $15.
1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Animal Husbandry S-9. (Special Dairy Cattle Course) I.
For dairy technology seniors and poultry husbandry freshmen. This course will consider the advantages and disadvantages of dairy farming. The principles of genetics and the art of breeding better dairy cattle will be emphasized. The balance of the course will include basic principles of dairy cattle feeding as well as profitable management of the dairy herd. Laboratories will be devoted to various exercises and problems concerned with the feeding, breeding and management of dairy cattle. A one-day field trip to successful dairy farms is required in the course. Estimated cost $5. Textbook: Henderson and Reaves, "Dairy Cattle Feeding and Management."
2 class hours and 1 2-hour laboratory period a week. Credit, 3.
Mr. Foley.

Note—Every student in this major must pass a qualifying test in milking. Arrangements for practice periods and examinations by special assignment. No student will be put in placement training who has not satisfied this preliminary requirement.

ARBORICULTURE

Assistant Professor King

Arboriculture, the care of shade and ornamental trees, is becoming more important here in Massachusetts as the citizens realize the necessity of trees in their everyday life. It includes tree planting; large tree moving; diagnosis and treatment of tree disease, defects, and mechanical injuries; identification and control of tree insect pests; fertilizing; pruning and repair of storm or otherwise damaged trees; and removal of dead or undesirable trees.

A growing appreciation of the value of trees and a demand for a tree maintenance service has led to the development of organizations to supply it. These firms desire trained men. All Massachusetts towns are required to elect tree wardens. At present there are over a thousand men actively engaged in municipal and private tree care in Massachusetts and the future is unlimited on a state basis. Nationally, over 300 million dollars is spent annually on shade and ornamental trees. The men who accept this responsibility should be trained in the requirements of trees and their care. This course is designed to give basic training in the care of shade and ornamental trees to supply these needs.

The University offered the first course in the country on shade tree care in 1895, and now offers the only complete two-year arboriculture course in the United States. Annually in March, a school of one week's duration for tree wardens, arborists and utility men is held on the campus. Parts of the program of the school will be of interest to students in this course.

The University campus of 700 acres has a wide variety of trees of all ages with which the student becomes acquainted, and which also serves as a laboratory for problems similar to those one will have to meet in practice. The research laboratory in shade tree diseases for the state is also located on the campus.

The Massachusetts Arborists Association and the Massachusetts Tree Wardens and Foresters Association have approved this course as a basic training program.

There is no limit to the number of qualified individuals who will be admitted as freshmen, providing a minimum of three months is spent in arboriculture work just prior to admittance.

Those electing arboriculture must register one week prior to the opening of the fall semester for the preliminary training period. Applicants will be notified of the date of registration. This one-week period before the start of regular class work will be used for intensive training in the use of ropes, climbing, and the use of knots and safety practices. Eight hours a day will be given over completely to this purpose. Only those who qualify in this preliminary program may take the landscape operations course. All students applying for the course must have a doctor's certification that they are physically fit. Any heart ailment or other serious weakness automatically disqualifies an applicant.

Field trips will be required during the two years at an estimated cost of $40, other than those conducted during laboratory periods.

JOB OPPORTUNITIES:

Operators, foremen and salesmen for arboriculture firms, utility line clearance foremen, deputy tree wardens and eventually tree wardens in

towns and cities, tree care in estates, parks, state highways, college campuses or grounds of other public institutions, developing one's own service organization for the practice of arboriculture.

An accident insurance policy will be required of all prospective students. Such a policy will be available at the University at time of registration.

Arboriculture

First Year

First Semester

(Eighteen Weeks Resident Instruction)
Agronomy S-1 (Soil Management)
Agrostology S-5 (Basic Factors, Construction and Maintenance of Fine Turf Areas)
Arboriculture S-0 (Tree Climbing. Special Qualifying Course)
Arboriculture S-1 (Practices and Policies)
Botany S-1 (Tree Physiology)
Landscape Operations S-1 (Tree Identification)
Public Speaking S-1

Elective

Physical Education S-1 (Football)

Second Semester

(Eight Weeks Resident Instruction followed by Six Months Placement Training)
Agricultural Engineering S-2 (Power Units)
Agronomy S-2 (Fertilizers)
Arboriculture S-2 (Continuation of S-1)
Botany S-2 (Diseases of Trees and Shrubs)
Entomology S-4 (Insect and Related Pests of Shade and Ornamental Trees and Shrubs)
Landscape Operations S-2 (Plant Propagation)
Public Speaking S-2

Elective

Physical Education S-4 (Basketball)

Second Year

First Semetser

(Sixteen Weeks Resident Instruction)
Arboriculture S-3 (Diagnosis and Control)
Arboriculture S-7 (Shade Tree Surveys and Cost Estimates)
Business English S-1
Entomology S-5 (Control of Insect and Related Pests of Shade and Ornamental Trees and Shrubs)
Forestry S-3 (Farm Forestry)
Landscape Operations S-7 (Surveying and Mapping)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Arboriculture S-6 (Shade Tree Spraying)
Arboriculture S-8 (Shade Tree Surveys and Cost Estimates)
Business Management S-4
Fruit Growing S-4 (Fruit Pests and Spraying)
Landscape Operations S-6 (Shrub Identification)
Landscape Operations S-8 (Landscape Construction)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Arboriculture S-O (Tree Climbing) I.

For two weeks previous to the regular opening of school, all students electing this major will attend a special qualifying course in tree climbing. This course will be conducted on the campus for eight hours each day for two weeks to acquaint the student with ropes, tools and climbing techniques. To be enrolled in the arboriculture major all students must pass this qualifying tree climbing practice.

Mr. King.

Arboriculture S-1. (Practice and Policies) I.

Material covers pruning, cabling, bracing, fertilization and line clearance. Laboratory work in the application of class discussion. A one-day trip to attend the annual meeting of the Massachusetts Arborists' Association is required.

2 class hours and 1 4-hour laboratory period a week. Credit, 4.

Mr. King.

Arboriculture S-2. (Continuation of S-1) II.

Soils, their origin structure and function as pertaining to tree growth and development. Fertilizers—use, sources, applications and functions of elements in the growth and development of a tree are covered. Common tree diseases and treatment and simple cavity treatments are included. Attendance required at the annual meeting of the Massachusetts Arborists' Association.

2 class hours and 1 4-hour laboratory period a week. Credit, 4.

Mr. King.

Arboriculture S-3. (Diagnosis and Control) I.

Individual and class assignments in the diagnosis of infectious and non-infectious diseases and the proper treatments and corrective measures. Analysis of symptoms and effects common to infectious diseases and environmental influences. Methods and techniques used to determine the causes and their treatments.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. King.

Arboriculture S-6. (Shade Tree Spraying) II.

Spray materials, equipment, and charts for shade tree insects, fungi, and weed control. The laboratory periods will be devoted to the actual application of spray material in the field. Attendance required at the annual meeting of the Massachusetts Tree Wardens and Foresters' Association.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. King.

Arboriculture S-7 and S-8. (Shade Tree Surveys and Cost Estimates) I. II.

The use and determination of shade tree surveys. Time and cost estimates and shade tree maintenance programs as determined by shade tree surveys. City planting and planning programs essential for city and street care and development. Line clearance and tree laws of various states. Arboriculture S-7—A one-day trip to attend the annual meeting of the Massachusetts Arborists' Association. Arboriculture S-8—A three-day field trip to Connecitcut and New York Botanical Garden to visit private, municipal and research organizations.

1 class hour and 1 4-hour laboratory period a week for Arboriculture S-7. Credit, 3.

2 class hours and 1 4-hour laboratory period a week for Arboriculture S-8. Credit, 4.

ONE YEAR ARBORICULTURE COURSE

Assistant Professor King

This course is available to a limited number of Stockbridge graduates (landscape operations, forestry, or floriculture are prerequisites) who wish to take one year of arboriculture. The course to be taken will be those in the arboriculture major not covered by the above major in which the student graduated. Prospective students must show ability to climb and must complete three months' placement before starting this course.

Private and municipal tree organizations usually prefer a graduate who has studied both horticulture and arboriculture since most of these organizations do general landscaping, nursery and tree work.

A one-year certificate is granted upon satisfactory completion of the year's work, subject to the scholastic requirement of the school. The certificate is awarded at the Stockbridge School graduation exercises.

DAIRY TECHNOLOGY

Professor Hankinson, Assistant Professor Potter
Assistant Professor Evans

A major program of study in the Department of Dairy and Animal Science.

The two-year course in dairy technology provides the student with an understanding of the handling and processing of milk and its products from the time the milk leaves the cow until it reaches the consumers' table. Students electing this course are preparing themselves for future work in the processing of dairy products and its related fields.

All dairy technology courses are given in Flint Laboratory, a building devoted specifically to the handling, processing, and testing of milk and its products. The building is well equipped with adequate facilities to provide classroom instruction in dairy processing. Commercial scale operations exist in processing milk and ice cream.

The market milk department contains a homogenizer, high temperature short time and vat pasteurizing equipment, a clarifier-separator, a vacuum bottle filler and capper, rotary can washer and automatic soaker type bottle washer.

For the manufacture of ice cream, the equipment includes a pasteurizing vat, homogenizer, cooler, batch freezer, continuous freezer, fruit feeder, and small scale facilities for making popsicles and fancy ice cream.

The by-products rooms include a churn, cheese vats and presses, and a vacuum pan for condensing milk. The testing laboratories are well equipped for performing the Babcock, Mojonnier and other tests for determining the chemical and bacteriological quality of dairy products.

JOB OPPORTUNITIES:

Skilled workers in wholesale and retail dairy plants including laboratory technicians, pasteurizer operators, ice cream mix makers, freezer operators, cheese-makers, salesworkers, and by-products manufacturers; also dairy equipment and supply salesmen, fieldmen and Dairy Herd Improvement Association testers. Such training supplemented with sufficient practical experience may lead to positions such as assistant plant superintendents and plant managers.

Field trips will be required during the two years at an estimated cost of $20 per student.

While working in the dairy laboratories, white suits and rubber footwear are required, at an estimated cost of $10.

Dairy Technology

First Year

First Semester	Second Semester
(Sixteen Weeks Resident Instruction)	(Eight Weeks Resident Instruction followed by Six Months Placement Training)
Agricultural Economics S-1 (Farm Economic Problems)	Agricultural Economics S-6 (Dairy Business Accounting)
Agricultural Engineering S-1 (Farm Powers)	Dairy Technology S-2 (Plant Equipment and Sanitation)
Bacteriology S-1 (Bacteriology and Rural Hygiene)	Food Technology S-2 (Basic Principles and Freezing)
Dairy Technology S-1 (General Dairying)	Food Technology S-4 (Special Products)
Entomology S-3 (Structural Pests)	Practical Science S-8
Nutrition S-3 (Elementary Nutrition)	Public Speaking S-2
Practical Science S-7	**Elective**
Public Speaking S-1	Physical Education S-4 (Basketball)
Elective	
Physical Education S-1 (Football)	

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Animal Husbandry S-9 (Special Dairy Cattle Course)
Business English S-1
Business Management S-3
Dairy Technology S-3 (The Ice Cream Industry)
Dairy Technology S-5 (Evaluation of Dairy Products)
Dairy Technology S-7 (Cheese and Cultured Dairy Products)
Veterinary Science S-1 (Animal Sanitary Science)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Agricultural Economics S-2 (Marketing)
Agricultural Engineering S-6 (Dairy Mechanics)
Bacteriology S-4 (Dairy Bacteriology)
Dairy Technology S-4 (The Fluid Milk Industry)
Dairy Technology S-10 (Concentrated Dairy By-Products)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Dairy Technology S-1. (General Dairying) I.

Considers the importance of dairying in the United States, and especially in New England, giving the development of dairying from the earliest to the present time. It covers the secretion, composition and properties of milk; reasons for variation in the percent in fat in different samples of milk; the Babcock test for fat in milk and other dairy products; other common milk tests; the advantage of testing herds, Herd Improvement Association, advanced registry work; the handling of market milk; soft cheese making, ice cream making, and butter making as applied to general farm conditions. The laboratory work consists of testing milk and dairy products for butter fat, solids, and acidity, together with some dairy plant experience in milk handling, butter making, cheese making, and ice cream making.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Evans.

Dairy Technology S-2. (Plant Equipment and Sanitation) II.

Lectures are devoted to the cleaning and sanitizing of dairy equipment and its relation to the production of high quality dairy products. The laboratory work is devoted to methods of determining concentrations of cleaning and sanitizing agents and quality tests of dairy products. In addition to the testing work in the laboratory, students will be scheduled for work in the dairy processing plant in Flint Laboratory in order to become familiar with dairy plant practices and the operation of dairy equipment.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Potter.

Dairy Technology S-3. (The Ice Cream Industry) I.

A study is made of the modern methods of manufacturing the common frozen dairy products (ice cream, sherbets, ices, soft serve products, etc.) Lecture periods are devoted to the ingredients used in ice cream, methods of preparing and processing the mix, the freezing process, packaging, methods of hardening, and distribution of the finished product. The production of the other frozen products is also included.

The laboratory work involves the preparation and standardization of ice cream mixes, the freezing of ice cream and other frozen dairy products, and laboratory tests for butterfat, total solids, etc., as applied to these frozen dairy products.

2 class hours and 2 3-hour laboratory periods a week. Credit, 5.

Mr. Potter.

Dairy Technology S-4. —(The Fluid Milk Industry) II.

In this course attention is given to the necessary essentials in producing high quality milk, the economics of milk production and distribution, care of milk on the farm, transportation, and the various processing steps in the plant from receiving through processing to distribution.

The laboratory work involves numerous chemical and bacteriological quality tests on fluid milk and the operation of equipment used in processing market milk.

2 class hours and 2 3-hour laboratory periods a week. Credit, 5.

Mr. Evans.

Dairy Technology S-5. (Evaluation of Dairy Products) I.

This course is a study of the grading and evaluating of dairy product quality based upon product flavor, odor, appearance, and body and texture characteristics. Consideration is given to identification and correction of quality defects. Judging of milk, ice cream, butter and cheese.

1 2-hour laboratory period a week. Credit, 1.

Mr. Potter.

Dairy Technology S-7. (Cheese and Cultured Dairy Products) I.

The lecture periods are devoted to the fundamentals in the preparation and care of cultures, the methods involved in the production of cultured buttermilk, cottage cheese, and the manufacturing and curing of ripened cheese. In the laboratory work students receive practice in the propagation of cultures and in the manufacture of various types of cultured dairy products and cheese.

1 class hour and 1 3-hour laboratory period a week. Credit, 2.

Mr. Evans.

Dairy Technology S-8. (Selection and Evaluation of Dairy Products) II

This course is arranged for students specializing in food management to provide a basis for the more intelligent selection of dairy products.

It includes a consideration of the composition, food value, selection, and use of the different dairy products; a careful study of the methods of marketing and grading; a survey of processing methods and types of packages; and laboratory practice in testing milk products and in evaluating and identifying quality of milk, butter, cheese, ice cream, and other dairy products.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Hankinson.

Dairy Technology S-10. (Concentrated Dairy By-Products) II.

The lecture periods are devoted to milk and cream quality as related to the finished products, modern methods of making butter, and the manufacture of various concentrated products such as sweetened condensed, evaporated, dried milks, dried whey, etc. The laboratory work is devoted to various phases of butter manufacture from separation of the milk to the packaging of butter, operation of the vacuum pan, the production and laboratory examination of concentrated dairy products.

1 class hour and 1 3-hour laboratory period a week. Credit, 2.

Mr. Potter.

FLORICULTURE

Professor Boicourt, Assistant Professor Ross, Assistant Professor Jester, Mr. Goddard

Students who complete the major in floriculture are fitted primarily for work in commercial and private estate greenhouses and retail flower stores. After gaining experience such students may be able to start in business for themselves. With courses required of floriculture majors in landscape operations they are also qualified for positions on private estates, in parks and nurseries.

The offices and classrooms of the department are located in French Hall, named in honor of Henry F. French, the first president of the Massachusetts Agricultural College.

The glass area of the department consists of approximately 19,000 square feet: (1) the French Hall Range of 11,800 square feet, a commercial type of range with separate houses devoted to various crops; automatic ventilation has been installed in four of the units; (2) the new Durfee Conservatories, erected in 1954, 5,000 square feet; curved eave construction, steel frame and aluminum members, aluminum barcaps, automatic ventilation and automatic steam control; the five units provide a Desert House, Cool House, Show House with pool, Orchid House and Camellia House; (3) approximately 2,200 square feet in hotbeds and coldframes.

Land is available for the outdoor culture of florists' crops. At present an extensive perennial garden is being developed by floriculture and landscape operations.

JOB OPPORTUNITIES:

Skilled workers in commercial greenhouses and on private estates, growing all types of flower crops; wholesale and retail florists, growers, salesmen, managers; flower arrangement work, designers and decorators in retail flower stores; salesmen for florists' supplies and equipment.

Students who major in floriculture are required to purchase in the first semester of the first year, Taylor's Garden Dictionary, estimated at $5.

Field trips will be required during the two years at an estimated cost of $20.

Floriculture

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S-1 (Soil Management)
Floriculture S-1 (Garden Materials)
Floriculture S-3 (Greenhouse Management)
Landscape Operations S-1 (Tree Identification)
Public Speaking S-1
Vegetable Growing S-1 (Principles of Vegetable Culture)

Elective

Physical Education S-1 (Football)

Second Semester

(Eight Weeks Resident Instruction followed by Six Months Placement Training)
Agronomy S-2 (Fertilizers)
Botany S-2 (Diseases of Trees and Shrubs)
Entomology S-2 (Insect and Related Pests of Florists' Crops)
Floriculture S-2 (Greenhouse Construction and Heating)
Floriculture S-4 (Professional Literature and Reports)
Landscape Operations S-4 (Landscape Maintenance)
Public Speaking S-2
Vegetable Growing S-2 (Principles of Vegetable Culture)

Elective

Physical Education S-4 (Basketball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S-3 (Farm Shop)
Business English S-1
Floriculture S-5 (Commercial Production)
Floriculture S-7 (Flower Arrangement)
Fruit Growing S-7 (Small Fruits)
Landscape Operations S-5 (Plant Propagation)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Business Management S-2 (Fundamentals of Business Management)
Floriculture S-6 (Commercial Production)
Floriculture S-8 (The Uses of Herbaceous Plants)
Floriculture S-10 (Conservatory Plants)
Landscape Operations S-6 (Shrub Identification)
Vegetable Growing S-4 (Vegetable Forcing)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Floriculture S-1. (Garden Materials) I.

A study of the annuals, biennials, herbaceous perennial bulbs, and bedding plants which are commonly used in commercial floriculture and in private estate work. Methods of propagation, culture and uses are considered. Laboratory exercises include work in propagation, planting, identification of materials and planning of beds and borders.

3 class hours and 1 2-hour laboratory period a week. Credit, 4.

Mr. Jester, Mr. Goddard.

Floriculture S-2. (Greenhouse Construction and Heating) II.

The origin, growth, and importance of the floricultural industry; types of greenhouses, types of construction, painting, glazing, ventilators, beds and benches, and methods of heating. Trips may be taken to visit greenhouse ranges in the vicinity of Amherst with University transportation.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

The Department.

Floriculture S-3. (Greenhouse Management) I.

A study of the principles of greenhouse management including the consideration of location, soils, fertilizers, watering, ventilation, temperature regulation, insect and disease control. Methods of wrapping and packaging of plants and instruction in elementary plant breeding.

3 class hours and 1 2-hour laboratory period a week. Credit, 4.

Mr. Ross., Mr. Goddard.

Floriculture S-4. (Professional Literature and Reports) II.

Library reading and study on assigned subjects in the field of Floriculture. Oral and written reports.

1 2-hour period a week. Credit, 1.

The Department.

Floriculture S-5. (Commercial Production) I.

Courses S-5 and S-6 are devoted to a consideration of the important commercial crops. Special attention is given to the culture (under glass) of carnations, roses, chrysanthemums, sweet peas and snapdragons. Other cut-flower crops and seasonal pot plants are also considered. Modern methods of production including soilless culture and subirrigation practices are discussed in detail.

All members of the class may be required to take a one-day trip to visit a large commercial greenhouse range at an approximate cost of $10.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.
Mr. Jester.

Floriculture S-6. (Commercial Production) II.
A continuation of Floriculture S-5.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.
Mr. Jester.

Floriculture S-7. (Flower Arrangement) I.
The lectures include a discussion of the principles and techniques underlying the use of flowers in corsages, wedding bouquets, vase, bowl, and basket arrangements, table decorations, funeral designs and sprays, and decorations for public functions. The study of color and color harmonies is also considered in this course. The laboratory periods provide opportunity for actual practice in making the various types of arrangements which are considered in the classroom.
Students enrolled in this course are required to take a one-day trip to attend the United Florists' Trade Fair and School in Boston.
1 class hour and 2 2-hour laboratory periods a week. Credit, 3.
Mr. Ross.

Floriculture S-8. (The Uses of Herbaceous Plants) II.
This course is a continuation of Floriculture S-1 and is intended for students majoring in floriculture and landscape operations. It provides opportunity for a more detailed study of many of the plants considered in the preceding course with special emphasis on their uses in gardens and in other types of landscape planting. Lectures, assigned readings, study and identification of plants, planning of borders and gardens.
Students enrolled in this course take a one-half day trip to attend the Western Massachusetts Flower Show in Springfield.
2 class hours and 1 4-hour laboratory period a week. Credit, 4.
Mr. Goddard.

Floriculture S-10. (Conservatory Plants) II.
A study of the plants, both foliage and flowering, used in conservatories and in decorative work or sold in the retail flower shop. Methods of propagation, culture, uses and identification of plants are included in the course. Trips may be taken to visit the conservatories at Smith and Mount Holyoke Colleges with university transportation.
1 class hour and 1 2-hour laboratory period a week. Credit, 2.
Mr. Ross.

FOOD MANAGEMENT

Professor Esselen, Assistant Professor Baker,
Assistant Professor Cournoyer

Food management work, in all its various trade sub-divisions, is closely allied to food production work. Purchasing agents for wholesale and retail food chains must know vegetables and fruits of all kinds, meats, and dairy products such as milk, butter, cheese and ice cream; poultry products such as fowl, ducks, turkeys, and all kinds of eggs, and egg products. This same knowledge of superior grades, varieties, and packs of all agricultural products, as well as the modern methods of cooling, freezing, preserving, processing, and serving, is highly essential to the hotel and restaurant industry for its supply of future managers, stewards, and operators. Lunchroom, tearoom and all summer resort operators should have thorough training in the procurement of food supplies of superior quality if trade competition and public demands are to be efficiently and economically controlled.

Modern methods of food processing including canning, freezing, dehydration and packing, place a greater responsibility on institutional buyers. Sound knowledge in food production methods may be considered essential to the complete training of stewards, food managers, and restaurant operators. "In-plant" feeding installations for large factories and shops, now offer tremendous fields for food management efficiency and service.

Planning of menus and preparation of food is studied and practiced in this course, along with a complete survey of the whole food production program in agriculture. The excellent equipment of the farms, orchards, food technology laboratories and dining halls, is a major factor for thorough training which the University provides.

This course is sponsored by the Massachusetts Hotel Association, New England Club Managers, Boston Stewards' Club, and by the Massachusetts Restaurant Association, whose members are cooperating in the placement and employment of students and graduates. The Boston Stewards' Club has generously donated an annual scholarship prize fund and the state hotel association has established a loan fund for student aid.

Due to the nature of the course and need for careful selection of candidates based on scholastic preparation, business objectives, and experience factors determining choice of course, a personal interview is required of all applicants before final acceptance can be given. Students who select food management as a major should have completed a full high school course and must present school record at interview.

JOB OPPORTUNITIES:

Stewards, assistant stewards, and supervisory positions in restaurants, cafeterias, hotels, country inns and vacation resorts serving both summer and winter clientele. All New England states have a huge business in their country areas, providing home-grown foods and food products for the year-round vacation trade. Many farm homes and boarding houses rely on this

type of business for a considerable part of their income. New England foods from shore and farm have earned a distinctive quality which this course seeks to maintain.

Field trips will be required during the two years at an estimated cost of $52 per student.

Food Management

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Food Management S-1 (Quantity Foods—Preparation and Service)
Food Management S-3 (Stewarding)
Food Management S-5 (Special Lectures)
Foods and Nutrition S-1 (Basic Food Principles, Meal Planning and Service)
General Mathematics S-1
Poultry Husbandry S-9
Practical Science S-7
Public Speaking S-1

Elective

Physical Education S-1 (Football)

Second Semester

(Sixteen Weeks Resident Instruction followed by Four Months Placement Training)
Agricultural Engineering S-12 (Food Handling Equipment)
Food Management S-2 (Quantity Foods—Preparation and Service)
Food Management S-4 (Dining Room Management)
Food Technology S-2 (Basic Principles, Freezing, and Canning)
Practical Science S-8
Public Speaking S-2
Vegetable Growing S-10 (Marketing Methods)

Elective

Physical Education S-4 (Basketball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Bacteriology S-3 (Food Sanitation)
Entomolgy S-3 —(Structural Pests)
Food Management S-7 (Kitchen Administration)
Food Management S-9 (Food Service Practice)
Food Management S-11 (Hotel Accounting)
Food Management S-13 (Personnel Management)
Food Management S-15 (Special Lectures)
Food Technology S-5 (Food Manufacturing)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Agricultural Economics S-4 (Marketing)
Animal Husbandry S-8 (Food Management Meats)
Business English S-2
Dairy Technology S-8 (Selection and Evaluation of Dairy Products)
Food Management S-8 (Hotel Practices)
Food Management S-10 (Food Service Practice)
Food Mangement S-12 (Hotel Accounting)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Food Management S-1 and S-2. (Quantity Foods—Preparation and Service) I. II.

This course is planned to give the student an insight into the problems of the kitchen department of the hotel, restaurant or club. Students will be under the supervision of the manager of the University Commons and will be apprenticed to the regular employees there and will assist the cooks, baker, stock clerk, etc., during the laboratory periods. The course is planned so that each student will have the opportunity to do actual work in quantity food preparation and service.

1 4-hour laboratory period a week. Credit, 2.

Mr. Cournoyer.

Food Management S-3 . (Stewarding) I.

A study of principles and practices used in the purchasing, receiving, storing and issuing of all food stuffs. Employee practices, menu planning and pricing, and a study of proper cooking methods.

4 class hours a week. Credit, 4.

Mr. Baker.

Food Management S-4. (Dining Room Management) II.

A study of all types of table service for restaurants, hotels, and clubs. Self service operations, cafeterias, coffee shops, in-plant feeding, etc. Time is spent studying various types of banquet, buffet service and dining room organization, and supervision with breakdown of various positions—hostess, headwaiter, captains, waiters, and omnibus boys, etc.

3 class hours a week. Credit, 3.

Mr. Baker.

Food Management S-5 and S-15. (Special Lectures) I.

Registration restricted to Food Management students. These lectures will be presented weekly by men within the hotel and restaurant industry and allied professions and by members of the university faculty. They will cover a variety of subjects, all of which will be of interest and value to young people planning to enter the hotel and restaurant business.

1 class hour a week. Credit, 1.

The Department.

Food Management S-7. (Kitchen Administration) I.

This course will be a study of kitchen floor plans and layouts, with consideration given to equipment, design, maintenance and operation. Purchase and depreciation principles of food cost control will be studied at length. Field trips are required in this course.

2 class hours a week. Credit, 2.

Mr. Cournoyer.

Food Management S-8. (Hotel Practices) II.

A survey course of hotel procedures and practices pertaining to room service, banquets, front office, telephone, reservations, transportation and housekeeping. This course is designed to give an overall picture of the interdependence of each operating department.

3 class hours a week. Credit, 3.

Mr. Cournoyer.

Food Management S-9 and S-10. (Food Service Practice) I. II.

This course is a practice course in food service. Students will work under supervision of instructor and regular employees of Dining Commons in table service of special parties and functions. Time will also be spent on cafeteria line service. Course must be taken in conjunction with Kitchen Administration and Hotel Practices. There will be obligatory field trips to study various commercial operations.

1 4-hour laboratory period a week. Credit, 2.

Mr. Baker.

Food Management S-11 and S-12. (Hotel Accounting) I. II.

An introductory course in bookkeeping and accounting. Principles of double entry system, journalizing, posting and closing a practice set of accounts. Study also of balance sheet, and profit and loss statements.

Food Management S-12 is a continuation of S-11. Use of a practice kit for restaurant or small hotel. Subsidiary records, inventory controls, food and operating expense percentages.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Baker.

Food Management S-13. (Personnel Management) -.

A course designed to stimulate group employee relations. Covered during the course: Analyzing, simplifying, and evaluating the job; recruiting, selecting, and placing employees; training and rating employees; defining and measuring morale; fire and accident prevention; organizing personnel relations; increasing cooperation.

3 class hours a week. Credit, 3.

Mr. Cournoyer.

APPLIED FORESTRY

Professor Rhodes, Professor Holdsworth, Professor Rich,
Professor Trippensee, Assistant Professor Abbott,
Assistant Professor MacConnell, Mr. Bond

The two-year course in applied forestry is intended to equip young men with a sound understanding of the principles of growing wood and doing the work necessary to the handling of forests as productive enterprises.

The men who elect to take the course should fully understand that the vocation for which they are preparing will involve hard work, much of it physical in character. They should also keep in mind that a man trained in forestry techniques will be in a position to advance through apprenticeship to jobs of genuine responsibility.

There is a definite place in the broad field of forestry for trained workers who are capable of understanding and intelligently carrying out the tasks of a sub-professional character which are so necessary to forest maintenance and development.

Men who successfully complete the curriculum in applied forestry are qualified for places with timber growing and forest products industries, for supervision of forested estates, watershed properties, town forests and for work with certain public agencies which are concerned with forestry.

Entrance Requirements: A personal interview with each applicant is required. A copy of the applicants high school record must be presented at the time of interview. Mathematics preparation through elementary algebra and plane geometry is necessary. A good command of English is essential for report writing.

Student Limitation: Each entering class is limited to 20 men and must be selected on basis of scholastic preparation, sound purpose, and adequate physical ability.

Facilities: The University owns 2000 acres of forest easily accessible from the campus. This land is used for laboratory and field studies in forestry.

Placement Training: The program of study and vocational preparation requires the students of applied forestry to spend four months in suitable placement training. The placement jobs in forestry often require the student to work at considerable distances from home and he should be prepared to do this.

Equipment: The forestry department has good technical equipment for for laboratory and field study purposes.

Student Needs: In addition to the regular expense of the Stockbridge School the student must be prepared to buy a hand compass costing about $12 and aerial photographs costing about $4.

Forestry Club: This is a student organization for membership in which all students of Forestry, both Stockbridge and University are eligible. The programs are professional in character and present valuable material not otherwise available to students.

Applied Forestry

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S-1 (Soil Management)
Forestry S-1 (Dendrology)
Forestry S-5 (Forest Mensuration)
Forestry S-7 (Forest Physiology)
Review Mathematics S-3

Elective

Physical Education S-1 (Football)

Second Semester

(Sixteen Weeks Resident Instruction followed by Four Months Placement Training)
Business English S-2
Forestry S-2 (Wood Identification)
Forestry S-4 (Forest Insects and Fungi)
Forestry S-6 (Advanced Forest Mensuration)
Forestry S-8 (History of Forestry; Forest Economics)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Forestry S-9 (Land Surveying)
Forestry S-11 (Silvics)
Forestry S-13 (Harvesting)
Forestry S-15 (Forest Protection)
Forestry S-17 (Professional Literature and Reports)
Forestry S-21 (Photogrammetry)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Forestry S-10 (Forest Management)
Forestry S-12 (Applied Silviculture)
Forestry S-14 (Forest Products)
Forestry S-16 (Artificial Propagation of Forests)
Forestry S-18 (Wildlife Management)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Forestry S-1. (Dendrology) I.

The identifying features of the principal North American trees; their botanical classification and geographical distribution; their importance in American forestry; the vegetation regions of the United States and Canada.
1 class hour and 2 2-hour field or laboratory periods a week. Credit, 3.

Mr. Abbott.

Forestry S-2. (Wood Identification) II.

The gross structural and identification features of our most used North American woods. Each student must equip himself with a 10 power hand lens and a sturdy pocket knife. Instruction is given in the use of identification keys.
3 2-hour periods a week. (For lecture or for exercise in identification.)
Credit, 3.

Mr. Rich.

Forestry S-3. (Farm Forestry) I.

A course designed to give in one semester a working knowledge of the treatment of small woodlands. Methods of determining the volume and value of standing timber are practiced in the first half of the course; this is followed by practice in the application of silvicultural intermediate cuttings.
2 class hours and 1 4-hour field period a week. Credit, 4.

Mr. Bond.

Forestry S-4. (Forest Insects and Fungi) II.

A study of the principal forest insects and fungi; their life histories and identification and the nature of the damage they inflict or the good that they do in the forest.

3 class hours and 1 3-hour laboratory and field period a week. Credit, 4.

Mr. Abbott.

Forestry S-5. (Forest Mensuration) I.

Field and office work in measuring standing timber and the primary products cut from trees. The course offers training in timber cruising and scaling.

2 class hours and 1 7-hour laboratory period a week. Credit, 6.

Mr. MacConnell.

Forestry S-6. (Advanced Forest Mensuration) II.

Advanced work in forest mensuration; tree, stand, and forest measurements, scaling, and growth studies.

1 class hour and 1 7-hour laboratory period a week. Credit, 5.

Mr. MacConnell.

Forestry S-7. (Forest Physiology) I.

The structure and physiological functions of forest trees and other forest vegetation. Classroom course with demonstrations.

3 class hours a week. Credit, 3.

Mr. Abbott.

Forestry S-8. (History of Forestry and Forest Economics) II.

The development of forestry and forest policy in America; certain economic aspects of the developing field of American forestry.

3 class hours a week. Credit, 3.

Mr. Holdsworth.

Forestry S-9. (Land Surveying) I.

Field and office practice in plane and topographic surveying with emphasis on the use of tape, transit, and level. A map of forested properties will be prepared including all phases from searching records at the Registry of Deeds through location and measurement of boundaries on the ground to drafting-room procedure.

2 class hours and 1 6-hour laboratory period a week. Credit, 5.

Mr. Bond.

Forestry S-10. (Forest Management) II.

The organization of the forest for sustained yield management; forest regulation; forest management plans. A management plan will be prepared for a forest property of several thousand acres.

3 class hours and 1 4-hour laboratory period a week. Credit, 5.

Mr. MacConnell.

Forestry S-11. (Silvics) I.

The nature of forests, the silvical and reproductive characteristics of trees, and the influence of climate, soil, biotic factors, and fire on their establishment, growth, and development.

2 class hours and 1 4-hour laboratory period a week. Credit, 5.

Mr. Rhodes.

Forestry S-12. (Applied Silviculture) II.

The intermediate cuttings necessary to the production of wood as a crop; reproduction cutting methods to assure the continuity of the forest in connection with harvesting the mature trees.

2 class hours and 1 6-hour field or laboratory period a week. Credit, 5.

Mr. Rhodes and Mr. Bond.

Forestry S-13. (Harvesting) I.

The methods of harvesting various classes of direct forest products used in all parts of the United States; the use of woods tools and machines; practical field work.

2 class hours and 1 4-hour field period a week. Credit, 4.

Mr. Bond.

Forestry S-14. (Forest Products) II.

A study of the products of American forest and wood-using industries.

3 class hours a week. Credit, 3.

Mr. Bond.

Forestry S-15. (Forest Protection) I.

Methods of protecting the forest against fire and the other forest destructive agencies; regional problems and protective organizations.

3 class hours a week. Credit, 3.

Mr. Abbott.

Forestry S-16. (Artificial Propagation of Forests) II.

A study of forest tree seed; propagation of forests by direct seeding and planting; nursery management; methods to improve the inherent characteristics of forest growing stock.

2 class hours and 1 4-hour laboratory period a week. Credit, 4.

Mr. Abbott.

Forestry S-17. (Professional Literature and Reports) I.

Library reading and study on assigned forestry subjects. Written reports and original papers.

3 class hours and 2 hours of supervised library research a week. Credit, 5.

Mr. Holdsworth.

Forestry S-18. (Wildlife Management) II.

Effects of animals on the forest; the effects of forest practices on wild animal habitats and production.

3 class hours a week. Credit, 3.

Mr. Trippensee.

Forestry S-21. (Forest Photogrammetry) I.

The use of aerial photographs in forest mapping and estimating; interpretation of photographs; the use of stereoscope, sketchmaster, and other standard equipment. A map covering several thousands acres is prepared.

2 class hours and 1 4-hour laboratory period a week. Credit, 4.

Mr. MacConnell.

FRUIT GROWING

Professor French, Associate Professor Roberts, Mr. James Anderson

The course in fruit growing prepares the student for successful participation in the activities of our many sided fruit industry. An essentially practical course, it emphasizes also the basis principles of plant growth which underlie sound cultural practices and the economic principles which bear upon marketing procedures and the business side of fruit growing.

The University has about 50 acres of fruits easily reached from the classroom, which are used freely for purposes of illustration and study. Most of the trees and small fruits commonly found in New England are grown here on a commercial scale. Many experiments and tests are in progress in the plantations, offering exceptional opportunities to the student for the practical study of plant reactions under many and varied conditions. Excellent commercial orchards near the campus provide a wealth of additional material for observation and study. Large markets are visited to afford valuable contacts with the main channels of crop distribution.

Equipment for instruction includes a modern storage and packing house in which there are several types of refrigerated storage, a quick freezing unit, and zero temperature holding rooms. The principal types of orchard tools and machines, such as tractors, plows, harrows, cultivators, sprayers, dusters, and pruning and grafting tools are available for study and trial by students. Emphasis is placed on life histories and methods of control of all important insect, fungus and other pests. Materials used in pest control are also studied.

Graduates of the course in fruit growing are found in positions of responsibility all over the Northeast. Some have established successful fruit farms of their own. Others, after gaining added practical experience, have risen to positions as managers or foremen in large orchards. Still others have entered the industrial field and are employed by supply and equipment firms or are engaged in marketing activities. Fruit growing is an active and thriving industry which offers a field of continuing interest and many opportunities for profitable development to the earnest student.

JOB OPPORTUNITIES:

Skilled workers on fruit farms, operators, foremen, owners; packing house operators, managers of sales and distribution. Salesmen for commercial spray materials, orchard equipment, and fertilizers; fruit inspection and grading. Growers of specialty fruit crops.

Field trips will be required during the two years at an estimated cost of $25 per student.

Fruit Growing

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S-1 (Farm Power)
Agonomy S-1 (Soil Management)
Forestry S-3 (Farm Forestry)
Fruit Growing S-1 (Growing Tree Fruits)
Public Speaking S-1
Vegetable Growing S-1 (Principles of Vegetable Culture)

Elective

Physical Education S-1 (Football)

Second Semester

(Eight Weeks Resident Instruction followed by Six Months Placement Training)
Agricultural Engineering S-14 (Repair of Farm Equipment)
Agronomy S-2 (Fertilizers)
Entomology S-4 (Insect and Related Pests of Shade and Ornamental Trees and Shrubs)
Fruit Growing S-2 (Orchard Pruning)
Poultry Husbandry S-10 (General Poultry Husbandry)
Public Speaking S-2

Elective

Physical Education S-4 (Basketball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Economics S-1 (Farm Economic Problems)
Beekeeping S-1 (Fall Management, Wintering, Honey, and Bee Diseases)
Botany S-1 (Tree Physiology)
Business English S-1
Fruit Growing S-5 (Harvesting, Packing, Storage, and Marketing)
Fruit Growing S-7 (Small Fruits)
Vegetable Growing S-7 (Commercial Vegetable Culture)

Elective

Physical Education S-1 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S-10 (Farm Structures and Drainage)
Beekeeping S-2 (Spring Management, Pollination ahd Honey Production)
Farm Management S-4 (General Course)
Fruit Growing S-4 (Fruit Pests and Spraying)
Fruit Growing S-6 (Orchard Management)
Vegetable Growing S-6 (Marketing Methods)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Fruit Growing S-1. (Growing Tree Fruits) I.

Covers the planting and development of orchards and the management of bearing trees. The nature of the tree itself is stressed as the basis of sound cultural practices. The selection of sites and soils and varieties is studied for plantations of apples, pears, peaches, plums, and cherries. The handling of young trees to bring them into early profitable bearing is given special attention.

The culture of bearing orchards is studied in detail to give an understanding of the factors that influence yield and quality of fruit. Methods of soil management are considered with preference to their long-time effects on tree and soil. The experimental plots afford exceptional opportunities to study cultural methods and many subjects are discussed in the orchards.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. French, Mr. Anderson.

Fruit Growing S-2. (Orchard Pruning) II.

Aims to give the student a thorough training in the underlying principles and the practice of pruning apples, pears, peaches, cherries and plums. The bearing habit of each fruit is studied as a basis for effective pruning. Practice pruning in the University orchards is stressed as an important feature of the course. Instruction and practice in budding and grafting are included in this course. Bridge grafting and top working are given special attention.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Anderson.

Fruit Growing S-4. (Fruit Pests and Spraying) II.

Deals with the characteristics and behavior of insect and disease pests which attack fruit plants. Particular attention is given to the vulnerable points in their life cycles at which control measures are directed. A study of the principal spray materials and their uses is an essential part of the course.

The construction and care of spraying and dusting equipment is emphasized and students are required to use various types of implements in spraying and dusting trees in the orchard.

2 class hours and 1-2-hour laboratory period a week. Credit, 3.

Mr. Anderson.

Fruit Growing S-5. (Harvesting, Packing, Storage and Marketing) I.

Handling the crop from tree to consumer is the field covered. Methods of harvesting and appliances used are studied in the orchards. Practice in packing the most popular containers forms a prominent part of the laboratory work.

The principles of common and refrigerated storage are considered in detail and storage house construction is discussed with a critical examination of several storages in use on or near the campus. Marketing methods as they relate both to distant and to local markets are given special consideration. A two-day field trip is a part of the course. Estimated cost, $10.

2-class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Roberts.

Fruit Growing S-6. (Orchard Management) II.

A critical study of fruit growing as a business. It is the aim of the course to familiarize the student with conditions under which fruit must be grown here, with current thoughts on the more recent development, and with adjustments which are being made in the fruit industry of the Northeastern States.

Each student must be prepared to take one or more trips to prominent orchards. Estimated cost, $15.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Roberts.

Fruit Growing S-7. (Small Fruits) I.

There are many unusual opportunities in Massachusetts for success in growing small fruits. This course deals with the establishment and management of plantations of strawberries, raspberries, blackberries, blueberries,

currants, cranberries, and grapes. The aim is to make the course of the utmost practical value as well as to give an understanding of the fundamental principles on which practices are based.

The University has plantations of these fruits except cranberries which are used freely for laboratory purposes. Berries which ripen in summer are frozen and held in excellent condition for study in this course.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.
Mr. Anderson.

Fruit Growing S-9. (General Course) I.

For students in other majors who can devote one semester only to the subject of fruit growing. It deals with the practical side of growing tree and small fruits for home use and market. Special attention is given to such questions as selection of sites, choice of varieties, grafting, pruning, spraying, soil management, harvesting, and storing. (landscape operations and poultry majors.)
2 class hours and 1 2-hour laboratory period a week. Credit, 3.
Mr. Roberts, Mr. Anderson.

Fruit Growing S-10. (General Course) II.

This course is a repetition of Fruit Growing S-9 primarily for the benefit of first-year students who are specializing in animal husbandry.
4 class hours and 1 2-hour laboratory period a week. Credit, 5.
Mr. Roberts, Mr. Anderson.

LANDSCAPE OPERATIONS

Professor Blundell, Assistant Professor Procopico,
Assistant Professor Hamilton

The constantly increasing interest in development of grounds, both public and private, for use and enjoyment, has created a demand for men trained to handle the varied problems in the construction and maintenance of these grounds. The course in Landscape Operations aims to make the student familiar with these various problems.

Men who have taken this course are to be found in such different jobs as foremen in nurseries, or proprietors of nurseries which they themselves have developed; superintendents on private estates, cemeteries, parks, and various public and private institution grounds; foremen for landscape contractor firms, and some have organized their own business in landscape construction and landscape maintenance service.

With the whole campus as a laboratory, the student every day finds problems about him comparable to those he will meet when he goes to work. The broad lawns, the walks and drives, the gardens, the greenhouses, the orchards, the vegetable plots, as well as the farms, supply all the various phases of work which will be encountered on estates, in parks, or in institution grounds. As far as practicable the student is given the opportunity to determine what these problems are and to solve them himself under expert supervision.

On the campus is to be found a large and excellent collection of mature trees, shrubs and vines. From these plants the student is able to build up a background of plant knowledge; in identification; in propagation which is carried on in a special greenhouse for the purpose; in the handling of plants in various stages of their growth, in the nursery and on the campus; and in their ultimate care, pruning and protection against injuries of all kinds. Construction of roads, walks, drainage and other problems involving the moving of earth are especially valuable to those looking forward to landscape construction.

JOB OPPORTUNITIES:

Skilled workers in plant nurseries; gardeners, foremen or superintendents on private estates, public parks, cemeteries, and various public and private institution grounds; foremen with landscape contractors, real estate developments; owners and developers of their own landscape firms and nurseries, salesmen for seed and nursery concerns, plant propagators, botanic garden foremen.

A special requirement for students in landscape operations is one draftsman's set estimated at $25 obtainable at the University Store.

Field trips will be required during the two years at an estimated cost of $30 per student.

Landscape Operations

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S-1 (Soil Management)
Agrostology S-5 (Basic Factors, Construction and Maintenance of Fine Turf Areas)
Floriculture S-1 (Garden Materials)
Landscape Operations S-1 (Tree Identification)
Public Speaking S-1
Vegetable Growing S-1 (Principles of Vegetable Culture)

Elective

Physical Education S-1 (Football)

Second Semester

(Eight Weeks Resident Instruction followed by Six Months Placement Training)
Agronomy S-2 (Fertilizers)
Agrostology S-6 (Application of Basic Factors to Practical Problems)
Botany S-2 (Disease of Trees and Shrubs)
Entomology S-4 (Insect and Related Pests of Shade and Ornamental Trees and Shrubs)
Landscape Operations S-4 (Landscape Maintenance)
Landscape Operations S-6 (Horticulture Literature and Reports)
Public Speaking S-2
Vegetable Growing S-2 (Principles of Vegetable Culture)

Elective

Physical Education S-4 (Basketball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Arboriculture S-1 (Practices and Policies—Lectures only)
Business English S-1
Entomology S-5 (Control of Insect and Related Pests of Shade and Ornamental Trees and Shrubs)
Floriculture S-3 (Greenhouse Management)
Fruit Growing S-9 (General Course)
Landscape Operations S-5 (Plant Propagation)
Landscape Operations S-7 (Surveying and Mapping)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Arboriculture S-2 (Practices and Policies—Lectures only)
Floriculture S-8 (Uses of Herbaceous Plants)
Fruit Growing S-4 (Fruit Pests and Spraying)
Landscape Operations S-8 (Landscape Construction)
Landscape Operations S-10 (Nursery Practices and Management)
Landscape Operations S-12 (Shrub Identification)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Landscape Operations S-1. (Tree Identification) I.

Study of evergreen and deciduous trees used in landscape work, their distinguishing characters and culture, with special reference to nursery and planting practice.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Blundell.

Landscape Operations S-2. (Plant Propagation) II.

This course will present the principles of plant propagation with special reference to their application to plant materials in nursery and greenhouse practice. The lectures are concerned with careful explanation of seedage, cuttage, graftage, layerage and division. In the laboratory the student propagates plants by each of these methods.

2 class hours and 2 2-hour laboratory periods a week. Credit, 4.

Mr. Procopio.

Landscape Operations S-4. (Landscape Maintenance) II.

This course is in preparation for placement and takes up such horticultural practices as pruning, planting, winter protection, and pest control, as relating to a gardening or nursery program.
1 class hour and 1 2-hour laboratory period a week. Credit, 2.
Mr. Procopio.

Landscape Operations S-5. (Plant Propagation) I.

This course will present the principles of plant propagation with special reference to their application to plant materials in nursery and greenhouse practice. The lectures are concerned with careful explanation of seedage, cuttage, graftage, layerage and division. In the laboratory the student propagates plants by each of these methods.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.
Mr. Procopio.

Landscape Operations S-6. (Horticulture Literature and Reports) II.

Library reading on ornamental horticultural subjects. Written reports required.
1 class hour and 2 hours of supervised library reading a week. Credit, 2.
Mr. Blundell.

Landscape Operations S-7. (Surveying and Mapping) I.

Practice in the use of simple surveying instruments as tapes, compasses, and levels used in the measurement of land surfaces, and the application of these instruments in landscape construction.
1 class hour and 2 2-hour laboratory periods a week. Credit, 3.
Mr. Hamilton.

Landscape Operations S-8. (Landscape Construction) II.

Continuation of Landscape Operations S-7, including the reading of landscape plans, figuring costs on construction problems, establishing grades and setting stakes for landscape development from working drawings.
1 class hour and 2 2-hour laboratory periods a week. Credit, 3.
Mr. Hamilton.

Landscape Operations S-10. (Nursery Practices and Management) II.

For landscape operations majors only. This course deals with the propagation, maintenance and planting of nursery plants. Laboratory work includes experience in advanced methods of propagation, lining out stock in cold frames and in the field, pruning, root pruning, and planting. Emphasis is placed on development of supervisory capacity. The student is given the opportunity to develop a nursery program. A one-day field trip to Education

Day of the Annual Convention of the New England Nurserymen's Association will be required. Estimate cost: $5.
2 class hours and 1 2-hour laboratory period a week, first half of semester.
1 class hour and 1 4-hour laboratory period a week, last half of semester.
Credit, 3.
Mr. Blundell.

Landscape Operations S-12. (Shrub Identification) II.

Study of shrubs and woody vines, both evergreen and deciduous, to enable the student to recognize the plants used in ornamental plantings and to familiarize him with the handling of these plants both in nursery practice and landscape work. A two-day field trip will be required. Estimated cost, $20.
1 class hour and 2-2-hour laboratory periods a week. Credit, 3.
Mr. Blundell.

POULTRY HUSBANDRY

Professor Fox, Associate Professor Vondell,
Associate Professor Smyth, Assistant Professor Banta,
Assistant Professor Anderson, Assistant Prfoessor Hough

There are excellent opportunities in poultry work for men and women who have had the proper training. Graduates from this department have taken their places as leaders in the industry and have filled them capably. Some of them own their own breeding farms, manage or assist in the management of commercial egg farms, while others are in those industries which are closely allied with the production and marketing of poultry products.

Six specialized courses and two general courses are offered by this department. Those students who specialize in poultry culture take all six of the specialized courses. The general course is designed to give the students specializing in other branches of agriculture and horticulture the fundamental principles underlying successful poultry raising when a sideline on the farm.

The facilities for practical instruction in poultry husbandry include quarters and equipment in Stockbridge Hall for efficient classroom teaching and demonstrations.

The University Poultry Farm, the practical laboratory, comprises classrooms and laboratories which provide facilities for practice in incubation, breeding, feeding, killing, picking, candling and grading eggs, caponizing, judging, sexing, construction of poultry houses and appliances, and other phases of poultry work.

The well-bred flock of about 1,500 adult birds consists principally of White Plymouth Rocks, Single Comb Rhode Island Reds, Barred Plymouth Rocks, Single Comb White Leghorns and New Hampshires. The largest flocks of approximately 150 birds are used primarily for practical experiments and demonstrations in housing, feeding, breeding and management. Equipment includes several types of lamp and mammoth type incubators; many styles of coal and electric brooders and chick batteries for brooding and rearing approximately 5,000 chicks. A flock of several hundred Jersey Buff and improved White Holland turkeys is maintained.

The practical phases of commercial poultry production are stressed in the courses offered.

JOB OPPORTUNITIES:

Skilled workers on poultry farms, owner operators and managers; poultry breeding farms; operation of incubators and brooders; wholesale and retail poultry meats; testing, grading and packing eggs; poultry cooperative sales work with eggs, dressed and live fowl; salesmen for poultry feeds and equipment; broiler production and day-old chicks; turkey and duck farms, breeding (record of performance) and disease control (Pullorum) field men.

Field trips will be required during the two years at an estimated cost of $37 per student. All poultry Stockbridge students will be required to make a trip to the Boston Poultry Show which is held sometime during the month of January. Estimated cost $6.

Poultry Husbandry

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S-1 (Soil Management)
Animal Husbandry S-9 (Special Dairy Cattle Course)
Bacteriology S-1 (Bacteriology and Rural Hygiene)
Dairy Technology S-1 (General Dairying)
Poultry Husbandry S-1 (Introductory Poultry Management)
Practical Science S-7
Public Speaking S-1

Elective

Physical Education S-1 (Football)

Second Semster

(Eight Weeks Resident Intsruction followed by Six Months Placement Training)
Agricultural Engineering S-4 (Farm Shop)
Agronomy S-2 (Fertilizers)
Animal Husbandry S-2 (Types and Breeds)
Poultry Husbandry S-12 (Specialties)
Public Speaking S-2
Vegetable Growing S-14 (General Course)

Elective

Physical Education S-4 (Basketball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Economics S-1 (Farm Economic Problems)
Agricultural Engineering S-7 (Farm Structures)
Fruit Growing S-9 (General Course)
General Mathematics S-1
Poultry Husbandry S-5 (Marketing)
Poultry Husbandry S-7 (Breeding)
Veterinary Science S-1 (Animal Sanitary Science)

Electives

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S-2 (Farm Power)
Agronomy S-4 (Field Crops)
Business English S-2
Farm Management S-4 (General Course)
Poultry Husbandry S-4 (Feeding)
Poultry Husbandry S-8 (Supervised Reading and Management)
Veterinary Science S-2 (Applied Animal Sanitary Science)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Poultry Husbandry S-1. (Introductory Poultry Management) I.

This course provides the student an introduction to the poultry industry by enterprises, e.g. market eggs, hatching eggs, broilers and meat production. The basic management practices concerned with incubation, brooding, rearing, and housing poultry are stressed. The laboratory will include poultry judging and evaluation for both meat and egg production.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.

The Department.

Poultry Husbandry S-4. (Feeding) II.

This course covers a study of the scientific principles of nutrition essential to commercial success. Rations properly balanced for various purposes will be calculated. A comparative analysis of the different methods of feeding is included.
3 class hours a week. Credit, 3.

Mr. Anderson.

Poultry Husbandry S-5. (Marketing) I.

A study of preparing eggs and poultry products to meet the requirements of the northeastern markets. Grades, prices and reports are studied in conjunction with different marketing methods. The laboratories are designed to cover the field of practical grading, internal study, candling and packing of eggs as well as selection, fattening and killing and dressing of poultry by the latest approved methods.

A one-half day class trip to Springfield markets in December is required. Estimated cost, $2. Textbook: Benjamin, Pierce and Termohlen's "Marketing Poultry Products."

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Vondell.

Poultry Husbandry S-7. (Breeding) I.

This course includes the basic principles of heredity necessary to an understanding of the inheritance of various morphological characteristics of the domestic fowl. Also stressed is the breeding plans used in the selection programs for meat and egg production.

3 class hours and 1 2-hour laboratory period a week. Credit, 4.

Mr. Fox.

Poultry Husbandry S-8. (Supervised Reading and Management) II.

Each student will be assigned references in the field in which he is most interested. Oral reports will be required. A major part of the work will be the writing of a term paper and students will be graded on their ability to summarize reference reading and on the neatness of their work. Required day trips totalling three or four days to representative commercial poultry areas are made at an approximate cost of $30. per student The basic factors essential to a financially successful poultry enterprise are analyzed.

3 class hours a week. Credit, 3.

Mr. Hough.

Poultry Husbandry S-9. I.

This course covers candling and grading of eggs, market classification, a study of eggs in the local markets, dressing poultry and various ways of preparing poultry for the table. Prices and market operations form an active part of the course.

A one-half day class trip to the Springfield markets in December is required. Estimated cost, $2.

1 class hour and 1 2-hour laboratory period a week. Credit, 2.

Mr. Vondell.

Poultry Husbandry S-10. (General Poultry Husbandry) II.

Poultry keeping as a national industry; its importance and geographical distribution; opportunities and possibilities in poultry culture in Massachu-

setts; principles of feeding; utility classification of fowl; incubation; the production of hatching eggs; the baby chick industry and brooding and rearing. Practical exercises will be closely correlated with the study of breeds and varieties, various types of incubators, brooders, brooder-houses, etc. Textbook: Jull, "Successful Poultry Maganement." Note: Students who take course S-10 must get permission from Poultry Department to take advanced poultry courses.

2 class hours and 2 2-hour laboratory periods a week. Credit, 4.

Mr. Vondell.

Poultry Husbandry S-12. (Specialties) II.

Turkeys, ducks, geese, and game birds are considered. Breeding, incubation, feeding, rearing, management, marketing, housing, and disease control methods and practices are studied. Most of the course is devoted to the study of turkeys. Textbook: Jull, "Raising Turkeys."

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Smyth.

TURF MAINTENANCE

Professor Dickinson, Associate Professor Roberts, Mr. Troll

There is an immediate need for skilled supervisors and assistants to park, cemetery, and recreation area superintendents. Municipal and private golf clubs are expecting that their superintendents shall be trained in turf maintenance. Every city and large town offers splendid opportunities for the private business horticulturist who is especially well trained to "take care of the lawn."

As the many proposed memorial parks, play fields, public buildings and golf courses are being constructed and completed, the demand for specialists in turf maintenance will be increased and the number of replacements needed annually will be large.

This course is arranged and taught in such a manner that a student who has completed the work will be well qualified to accept a position as assistant or the actual superintendency of a small park, cemetery, or golf course, or to establish a business in his community.

Laboratory and field exercises give practical experience and demonstrations. Good equipment is supplemented by loans from manufacturers and supply houses. The supporting courses are strong and have been carefully chosen for their close alliance to the problems of turf maintenance and general estate work.

Each student's placement training and special interest will be considered in his chosen field, whether it be park, cemetery, golf course, or private business, and professional men will visit the classes to give of their experiences. Every student will be required to keep a record of work done, results obtained, and observations made during the placement training period, for use during the senior year.

JOB OPPORTUNITIES:

Assistant to superintendents or as an actual superintendent on golf course, cemetery, park, or with a commercial nursery or landscape service company, also with golf course construction companies and equipment supply dealers.

At least one field trip will be required during the second semester of the senior year. The total cost of such a trip or trips to each student will not exceed $20.

Turf Maintenance

First Year

First Semester

(Sixteen Weeks Resident Instruciton)
Agronomy S-1 (Soil Management)
Agrostology S-1 (Basic Factors and Uses of Turf Areas)
Floriculture S-1 (Garden Materials)
Landscape Operations S-1 (Tree Identification)
Public Speaking S-1
Vegetable Growing S-1 (Principles of Plant Growth)

Elective

Physical Education S-1 (Football)

Second Semester

(Eight Weeks Resident Instruction followed by Six Months Placement Training)
Agricultural Engineering S-14 (Repair of Farm Equipment)
Agronomy S-2 (Fertilizers)
Agrostology S-2 (Construction and Maintenance of Turf Areas)
Botany S-2 (Diseases of Trees and Shrubs)
Business English S-2
Entomology S-6 (Turf Insects)
Public Speaking S-2

Elective

Physical Education S-4 (Basketball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S-9 (Structures and Drainage)
Agrostology S-3 (Turf Maintenance as a Business)
Aboriculture S-1 (Lectures)
Business English S-3
Landscape Operations S-5 (Plant Propagation)
Landscape Operations S-7 (Surveying and Mapping)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engeineering S-16 (Irrigation and Soil Conservation)
Agrostology S-4 (Practical Problems)
Arboriculture S-2 (Lectures)
Floriculture S-8 (The Uses of Herbaceous Plants)
Landscape Operations S-8 (Landscape Construction)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Agrostology S-1. (Basic Factors and Uses of Turf Areas) I.

Starting with an appreciation of the grass plant the course carries the fine, turf grasses from seed through uses. Identification of seed and vegetative growth. The limits of tolerance and factors affecting them are studied and correlated with the adaptation of the species to the user's specifications for various conditions.

3 class hours and 2 2-hour laboratory periods a week. Credit, 5.

Mr. Troll.

Agrostology S-2. (Construction and Maintenance of Turf Areas) II.

The student will adapt factors determined in the first semester to the practical construction of new turf areas and maintenance of existing turf. Fertilizing, controlling disease, clipping, watering, etc.

4 class hours and 2 2-hour laboratory periods a week. Credit, 6.

Mr. Roberts.

Agrostology S-3. (Turf Maintenance as a Business) I.

This course is primarily for those students desiring to become professional turf growers such as superintendents of golf courses, cemeteries, or parks. The cultural costs as well as the monetary costs are studied. Equipment, fungicides, insecticides and herbicides are evaluated. Experiences gained during summer placement are thoroughly discussed.

3 class hours and 2 2-hour laboratory periods a week. Credit, 5.

Mr. Dickinson.

Agrostology S-4. (Practical Problems) II.

Use of popular and technical journals as a guide to advanced and up-to-date information on turf culture is stressed. Field trips to research stations, sod farms and business organizations serving the turf field develop a broad understanding of turfgrass work. Practical problems on turf and equipment maintenance serve to summarize material of preceding courses for the turf major.

4 class hours and 1 3-hour laboratory period a week. Credit, 5.

Mr. Roberts, Mr. Troll.

Agrostology S-5. (Basic Factors, Construction and Maintenance of Fine Turf Areas) I.

At the completion of this course the student should have a knowledge and appreciation of the requirements for the growing of lawns and sports turf.

He will have considered the construction of turf areas; seed identification, selection and sowing; identification of turf grasses and their soil and fertilizer preferences, correct cultural practices and control of turf pests and diseases.

This course is for arboriculture and landscape operations majors.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Zak.

Agrostology S-6. (Application of Basic Factors to Practical Problems) II.

The interrelationships between grasses and their uses, and soil management problems is stressed. This gives the student a more thorough understanding of the nature of practical turfgrass work, the diagnosis and treatment of problem situations.

This course is for landscape operations majors only.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Troll.

VEGETABLE GROWING

PROFESSOR SNYDER, ASSISTANT PROFESSOR TUTTLE, MR. MAYNARD

There are many opportunities for both men and women who complete the Stockbridge School vegetable growing courses. These include the operation of a market garden, truck crop, or greenhouse business; skilled employees of commercial operators; operators or trained employees in the many types of wholesale and retail marketing; employees in responsible positions on private estates, private and state institutions as well as with commercial companies handling agricultural products such as fertilizers, seed and various supplies and equipment.

The production and marketing of vegetable crops is a highly specialized business involving a background of technical training as well as a knowledge of practical skills. The staff and facilities of the Department of Vegetable Growing are well qualified and adequate to give a thorough training to students in the fundamentals essential to growing, harvesting and marketing the many vegetable crops commonly grown in New England.

In addition to the facilities of the Department, trips will be made to several production areas and markets to observe actual operations

JOB OPPORTUNITIES:

Skilled workers on market garden and truck farms, growers of commercial vegetable crops in greenhouses, cold frames, and fields. Operating all types of farm machinery, tractors, cultivators, seeders, both motor and horse-drawn; preparing crops for market, sorting, grading, bunching, packing. Wholesale and retail sales and distribution. Workers for seed-growing firms, plant breeding and field work on testing plots. Operators, owners, managers of vegetable crop farms. State and federal market inspectors on commercial grades and packs. Buyers and inspectors for dehydration and quick freezer plants. Instititutional farm managers.

Field trips will be required during the two years at an estimated cost of $40.

Vegetable Growing

First Year

First Semester

(Sixteen Weeks Resident Instruction)
Agronomy S-1 (Soil Management)
Business English S-1
Floriculture S-3 (Greenhouse Management)
Fruit Growing S-1 (Growing Tree Fruits)
Public Speaking S-1
Vegetable Growing S-1 (Principles of Vegetable Culture)
Vegetable Growing S-3 (Systematic Vegetable Growing)

Elective

Physical Education S-1 (Football)

Second Semester

(Eight Weeks Resident Instruction followed by Six Months Placement Training)
Agronomy S-2 (Fertilizers)
Floriculture S-2 (Greenhouse Construction and Heating)
Fruit Growing S-2 (Orchard and Vineyard Pruning)
Poultry Husbandry S-10 (General Course)
Public Speaking S-2
Vegetable Growing S-2 (Principles of Vegetable Culture)
Vegetable Growing S-12 (Diseases, Insects, and their Control)

Elective

Physical Education S-4 (Basketball)

Second Year

First Semester

(Sixteen Weeks Resident Instruction)
Agricultural Engineering S-1 (Farm Power)
Agricultural Engineering S-9 (Drainage and Farm Structures)
Beekeeping S-1 (Fall Management, Wintering, Honey, and Bee Diseases)
Fruit Growing S-7 (Small Fruits)
Vegetable Growing S-5 (Market Practices)
Vegetable Growing S-7 (Commercial Vegetable Culture)

Elective

Physical Education S-5 (Football)

Second Semester

(Sixteen Weeks Resident Instruction)
Beekeeping S-2 (Spring Management, Pollination and Honey Production)
Farm Management S-4 (General Course)
Food Technology S-2 (Basic Principles, Freezing, Canning and Pickling)
Fruit Growing S-4 (Fruit Pests and Spraying)
Vegetable Growing S-4 (Vegetable Forcing)
Vegetable Growing S-6 (Marketing Methods)
Vegetable Growing S-8 (Commercial Vegetable Culture)

Electives

Physical Education S-4 (Basketball)
Physical Education S-6 (Baseball)

Vegetable Growing S-1. (Principles of Vegetable Culture) I.

Lecture periods are devoted to fundamental principles of plant structure and growth as they influence and regulate commercial vegetable culture. The work in the laboratory includes detailed studies in seedage, plant growing, manures and fertilizers, garden planting, pests, storage and marketing.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Tuttle.

Vegetable Growing S-2. (Principles of Vegetable Culture) II.

Lectures are devoted to the more important environmental factors of the soil and climate which regulate plant growth and reproduction, including water, temperature, light, humidity and wind.
3 class hours a week. Credit, 3.

Mr. Maynard.

Vegetable Growing S-3. (Systematic Vegetable Growing) I.

This course is designed to acquaint the student with the identification, nomenclature and classification of the standard types and varieties of vegetables; judging and exhibiting; seed production and variety improvement work.
1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Tuttle.

Vegetable Growing S-4. (Vegetable Forcing) II.

A study of the principles and practices involved in growing, harvesting and marketing of vegetable crops commonly grown in forcing structures, especially tomatoes, cucumbers, lettuce, mushrooms and rhubarb. Discussions will also include the growing and handling of vegetable plants for field setting, in plant houses, hotbeds and cold frames.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Maynard.

Vegetable Growing S-5. (Marketing Practices) I.

A study of the various factors and practices involved in harvesting, preparing for market (bunching, tying, wrapping, waxing), grading, packaging, packages used, brands and inspection of vegetables for various market outlets as well as packing house facilities and storage. Trips to nearby and Boston markets will cost approximately $10.
2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Snyder.

Vegetable Growing S-6. (Marketing Methods) II.

A continuation of the studies in S-5 covering the marketing of vegetables with emphasis on advertising, salesmanship, roadside markets, wholesale and retail outlets, market reports and transportation by truck, rail and plane.

3 class hours a week. Credit, 3.

Mr. Snyder.

Vegetable Growing S-7. (Commercial Vegetable Culture) I.

Problems and practices of the commercial grower are discussed as they involve seedage, planting, cultivation, irrigation, tools, machinery, farm organization, and management.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Maynard.

Vegetable Growing S-8. (Commercial Vegetable Culture) II.

This is a continuation of Vegetable Growing S-7 in which the discussions involve the cultural practices for the various vegetables of commercial importance in the New England area. Organized trips to market gardening areas are required which cover a period of approximately three days and cost about $30.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Tuttle.

Vegetable Growing S-9 and S-14. (General Course) I. II.

This course is designed to meet the needs of students in other majors who cannot devote more than one semester to a study of vegetable growing. Attention is to be given to starting plants early, transplanting, seeding, fertilizing, spraying, dusting, harvesting, marketing, and storing the more important vegetable crops.

3 class hours and 1 2-hour laboratory period a week. Credit, 4.

Mr. Maynard.

Vegetable Growing S-10. (Marketing Methods) II.

A course in the purchasing of vegetables designed only for students specializing in food management. It includes studies of the more important vegetables, sources of supplies, seasons of availability, grades, containers, and packs on our markets, and the characteristics associated with quality. Market outlets, types of dealers, and business methods of the vegetable trade will be examined.

A field trip to a wholesale market is required. Estimated cost, $10.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Tuttle.

Vegetable Growing S-12. (Diseases, Insects and their Control) II.

This course is intended to give those students majoring in vegetable growing an understanding of the more common insects and diseases which attack vegetable plants and the most satisfactory methods for controlling these pests.

2 class hours and 2 2-hour laboratory periods a week. Credit, 4.

Mr. Tuttle.

RELATED SUBJECTS IN OTHER DEPARTMENTS

Agricultural Economics S-1. (Farm Economic Problems) I.

An introduction to the more important economic problems facing New England farmers. Increasing competition with other farm sections, long-time movements of farm prices and farm profits, farm credit, farm taxation; tariffs and other farm relief measures are some of the problems to be considered.

2 class hours a week. Credit, 2.

Mr. Callahan.

Agricultural Economics S-2 and S-3. (Marketing) I. II.

This course deals with economic problems of marketing farm products. Particular attention is given to marketing methods used in New England and to the comparison of local methods with methods used by farmers in com. peting sections. Principles and methods of co-operative marketing used by-successful co-operative associations are studied in detail in order to show how New England farmers may meet competition from associations in other sections, either as individual producers or as officers or members of local associations.

3 class hours a week. Credit, 3.

Mr. Callahan.

Agricultural Economics S-4. (Marketing) II.

Instruction in purchasing and management for Hotel Stewards. A study of the distribution system for food, products will be given as well as merchandising practices, store location, advertising and personnel management.

2 class hours a week. Credit, 2.

Mr. Lindsey.

Agricultural Economics S-6. (Dairy Business Accounting) II.

Business arithmetic and bookkeeping are given consideration. The mathematics of fat determination, ice cream mixes, etc., are studied. An understanding of elementary bookkeeping principles involved in milk distribution also forms a part of the course.

3 class hours and 2 2-hour laboratory periods a week. Credit, 5.

Mr. Spindler.

Agricultural Engineering S-1 and S-2. (Farm Power) I. II.

A study of the principles of the gasoline engine and its accessories, as used in trucks, tractors and power units; and the application of electricity to farm operations, with particular emphasis on the selection, care and maintenance of electric motors. Exercises cover trouble shooting and minor repairs to gasoline engines; and the selection of proper wire size, overload protection, and the electrical equipment for farm electric appliances.

3 2-hour laboratory periods a week. Credit, 3.

Mr. Tague, Mr. Pira.

Agricultural Engineering S-3 and S-4. —(Farm Shop) I. II.

A study of adequate tools in a farm shop which can assist in solving farm construction and maintenance problems. Instruction is given in the care and use of carpenter's tools through exercises in bench work, repair of farm equipment, and building construction, including the mixing and placing of concrete. Exercises covering domestic water systems and the repair of farm machinery give the student experience in arc and gas welding, pipe fitting, soldering, and the use of machinist's tools. While the time is too limited for the student to develop much skill, the capabilities of the equipment can be adequately demonstrated.

3 2-hour laboratory periods a week. Credit, 3.

Mr. Pira, Mr. Powers.

Agricultural Engineering S-6. (Dairy Mechanics) II.

Designed for men interested in dairy plants and allied work, this course covers the principles and equipment involved in processing and refrigeration of milk products, together with the instrumentation necessary for process control.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Pira.

Agricultural Engineering S-7. (Farm Structures) I.

A study of principles of design of farm buildings, utilizing elementary structural mechanics and the characteristics of building materials. Experience in developing construction details results from the complete planning of a major farm building by the individual student.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

The Department.

Agricultural Engineering S-9 and S-10. (Farm Structures and Drainage) I. II.

A study of building materials, details of construction, simple structural mechanics, and the principles of design applied to farm buildings. Each student will design in detail one of the major farm buildings in which he is particularly interested.

About one-fourth of the time is given to the study of land drainage practice and the use of the engineer's level in laying out drainage systems.

1 class hour and 3 2-hour laboratory periods a week. Credit, 4.

The Department.

Agricultural Engineering S-12. (Food Handling Equipment) II.

A study of the principles of operation, the care and maintenance of kitchen and other equipment used in food preparation for large groups. Refrigeration, heating and cooking, cleaning, and lighting equipment, as well as pumps

and electrical appliances are covered in exercises which give incidental practice in soldering, pipe fitting, and the selection of proper wire size.

Through the cooperation of commercial agencies, a one-day period of special instruction on industrial kitchen equipment and commercial lighting applications is provided.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Tague.

Agricultural Engineering S-14. (Repair of Farm Equipment) II.

Instruction in the capabilities of arc and gas welding, soldering, pipe fitting, and machinists' tools in the repair and construction of farm machinery and miscellaneous farm equipment. Exercises cover the repair of machines and the study of pumps and water systems.

3 2-hour laboratory periods a week. Credit, 3.

Mr. Powers.

Agricultural Engineering S-16. (Irrigation and Soil Conservation) II.

The principles of design for irrigation systems and soil conservation practices applicable to the management of large turf areas.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Pira.

Agronomy S-1. (Soil Management) I.

Every agricultural interest is vitally concerned with the soil, its adaptations and its management for plant production. This course treats of the selection of suitable soils for the special purpose of agriculture, horticulture and floriculture.

Laboratory includes training in the use and interpretation of the maps of the U. S. Soil Survey and in tests of soil texture, organic matter and soil acidity. Practical field work will be given in judging the crop adaptation and value of soils.

As a field project the student will be required to make a study of some farm, nursery or florist's plant, from the standpoint of soil conditions and methods of soil management in relation to the enterprise as a whole.

2 class hours and 1 3-hour laboratory period a week. Credit, 3.

Mr. Zak, Mr. Southwick, and Teaching Fellows.

Agronomy S-2. (Fertilizers) II.

The origin, manufacture, purchase and use of commercial fertilizer materials. A study will be made of the interpretation of fertilizer formula, analysis and guarantee. Special attention will be given to the newer concentrated fertilizer materials and to those produced from atmospheric nitrogen. The laboratory work will give practice in the identification of fertilizer materials, in the calculation of fertilizer formulas, and in the preparation of fertilizer mixtures.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Zak, Mr. Southwick, and Teaching Fellows.

Agronomy S-4. (Field Crops) II.

The lecture hours of this course will be devoted to presentation of the most successful methods of fertilizing, cultivating, harvesting, and storing the field crops grown in New England. Special attention will be given to the choice of the best adapted varieties for the production of hay, pasture, corn, potatoes, and root crops.

The laboratory work will include the study of corn and potato varieties, identification of grass and weed species, and studies of purity and germination. Field observations of growing crops will be included as the season permits.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Southwick.

Bacteriology S-1. (Bacteriology and Rural Hygiene I.)

Basic fundamentals of microbiology and the problems of applied bacteriology in health, agriculture, and industry. Milk, water supply, sewage disposal, and food production are considered.

3 class hours a week. Credit, 3.

Mr. Larkin.

Bacteriology S-3. (Food Sanitation) I.

An introduction to basic bacteriological techniques, such as, use of the light microscope, staining methods, estimating bacterial density in water, milk, meats. Lectures, films, and reading assignments are integrated with the laboratory assignments to give the student a basic understanding of the morphological and cultural characteristics of bacteria. The cultural characteristics are related to sound practices of food sanitation.

3 class hours a week. Credit, 3.

Mr. Wisnieski.

Bacteriology S-4. (Dairy Bacteriology) II.

Various bacteriological tests for the estimation of the numbers and types of organisms in milk are studied. Special attention is given to basic laboratory procedures, the techniques advocated by standard methods, and their applications in the dairy field.

2 class hours and 2 3-hour laboratory periods a week. Credit, 5.

Mr. Larkin.

Beekeeping S-1. (Fall Management, Wintering, Honey, and Bee Diseases) I.

Individual handling of bees in the early fall, and field studies are made of the bee colony and its organization. Studies and practice in fall management are followed by a similar treatment of winter protection and the bees are then prepared for winter. During the latter part of the semester the surplus honey is extracted and prepared for market, a laboratory study made of the product and, finally, the commoner bee diseases are discussed and methods of control pointed out.

1 class hour and 1 2-hour laboratory period a week. Credit, 2.

Mr. Shaw.

Beekeeping S-2. (Spring Management, Pollination, and Honey Production) II.

The first part of the semester is occupied in assembling and studying the equipment used in beekeeping, but as soon as the weather permits, work is resumed on the bees in the apiary. Studies are made in spring management; pollination in the apple orchards is particularly stressed, and attention is then turned to the preparation of the colonies for honey production.

1 class hour and 1 2-hour laboratory period a week. Credit, 2.

Mr. Shaw.

Botany S-1. (Tree Physiology) I.

A study of the processes occurring in trees and their relation to the complex of activities constituting plant growth. Topics include basic considerations of anatomy and physiology of roots, stems and leaves. Absorption, transpiration, internal water relations, food synthesis, digestion, translocation and growth receive appropriate elementary treatment.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Bigelow.

Botany S-2. (Diseases of Trees and Shrubs) II.

A survey course dealing with the cause, nature, and general procedures of plant disease control. The profound influence environment exerts on plant disease, the role played by insects in their transmission and the major classes of plant pathogens, fungi, viruses and bacteria are briefly considered.

3 class hours a week. Credit, 3.

Mr. Banfield.

Business English S-1 and S-2. I. II.

This course is designed to cover review work in the fundamentals of grammar and composition, and to give students training and practice in writing various types of business letters and reports.

3 class hours a week. Credit, 3.

Mrs. Dubois.

Business English S-3. (Report Writing for Turf Maintenance Majors) I.

A discussion and writing course concerned with planning and setting up different kinds of reports.

3 class hours a week. Credit, 3.

Mrs. Dubois.

Business Management S-2. II.

This course is designed primarily for students majoring in floriculture. It involves a study of records and accounts used by florists; costs and prices; uses of capital and credit; house and store management; advertising; buying and selling; economic use of labor and equipment; general business trends as affecting the flower business; how the florist should make adjustments to meet economic changes; analyses of going concerns; and finally a bringing together of all information studied and applying it to the successful organization of a business. The entire course is to be made as applicable and practical as possible.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Lindsey.

Business Management S-3. I.

This course is designed primarily for students majoring in dairy technology. The principles of business organization and management are considered in relation to the successful operation of a dairy plant. The course includes a study of the following; various records and accounts used by dairies; costs and prices; uses of capital and credit; economic trends as affecting the business; how to make adjustments in the business to meet economic changes; analyses of different types of going concerns; and finally a bringing together of all the information studied and applying it to the successful organization of a business.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Callahan.

Business Management S-4. II.

For arboriculture majors. It will cover contracts, labor and property law. The accounting will involve principles and interpretation of accounts and the business management will bring together forming and financing a business, location theory and personnel relations.

3 class hours a week. Credit, 3.

Mr. Lindsey.

Entomology S-2. (Insect and Related Pests of Florists' Crops) II.

Course material is designed to provide a comprehensive study of insect pests of greenhouse and garden plants primarily for floriculture majors. It is devoted to an understanding of the nature of the pests encountered; types of damage, life histories, associations with environment, and the more important aspects of their control.

3 class hours and 1 2-hour laboratory period a week. Credit, 4.

Mr. Weidhaas.

Entomology S-3. (Structural Pests) I.

A course for majors in dairy technology, food management, and others, designed to acquaint students with the common structural pests (household, stored food, etc.) and how to prevent and eradicate them.

1 class hour and 1 2-hour laboratory period a week. Credit, 2.

Mr. Sweetman.

Entomology S-4. (Insect and Related Pests of Shade and Ornamental Trees and Shrubs) II.

Course material, for freshmen in landscape operations, arboriculture, and pomology, is devoted to an introduction to entomology and a study of major pest species; their recognition, and development. The course is basic to a further study of pests and their control for those in landscape operations and arboriculture who will take Entomology S-5. A summer collection of important pests may be required.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Wiedhaas.

Entomology S-5. (Control of Insect and Related Pests of Shade and Ornamental Trees and Shrubs) I.

Seniors in horticulture and arboriculture who have completed Entomology S-4. It is devoted to a more detailed study of important pests; their damage, life histories, environment, and distribution and to an understanding of the principles and practical methods of controlling those pests. Summer collections will be classified and studied during laboratory periods.

1 class hour and 2 2-hour laboratory periods a week. Credit, 3.

Mr. Weidhaas.

Entomology S-6. (Turf Insects) II.

A course designed to acquaint the student with the principal pests of turf. General introduction to entomolgy, followed by study of specific pests of turf.

1 class hour and 1 2-hour laboratory period a week. Credit, 2.

Mr. Hanson.

Farm Management S-1. (Introductory Course) I.

For freshmen. Provides background information necessary for the more detailed study of farm management which is offered during the senior year. Consideration is given to farm layout, arrangement of buildings, selection of enterprises, use of farm equipment, and efficient use of farm labor. Laboratory periods include practical problems in organizing and operating dairy and livestock farms.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Lee.

Farm Management S-3. (Advanced Course) I.

For Seniors. This course emphasizes the business aspects of managing a farm. It includes a study of farm appraisal, farm credit, farm organization and operation, farm records and accounts, farm business analysis, and production adjustments to meet economic changes. During laboratory periods actual farm records are used as part of practical problems in managing dairy and livestock farms.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Lee.

Farm Management S-4. (General Course) II.

For seniors with no previous work in farm management. A study is made of farm appraisal, farm credit, farm organization and operation, farm records and accounts, farm business analysis, and production adjustments to meet economic changes. Farm management principles are applied to practical situations on poultry, vegetable, and fruit farms. Actual farm records are used during laboratory periods to illustrate farm management problems.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Lee.

Foods and Nutrition S-I. (Basic Food Principles, Meal Planning and Service) I.

The basic science of food preparation and a general survey of the fundamental principles of nutrition including a study of the nutritive value of foods, conservation of the nutritive values; planning, preparation and serving

of family meals. Emphasis is placed upon organization, high standards in work techniques, quality of finished products.

3 class hours and 1 3-hour laboratory period a week. Credit, 4.

The Department.

Food Technology S-2. (Basic Principles, Freezing, Canning and Pickling) II.

Principles of food preservation including refrigeration and modern locker storage management are covered. Work is given in the use of packaging materials and the examination and grading of food products. Three field trips will be required. Estimated cost $10.

Note: This is a full semester course for freshman food management and senior vegetable growing majors; one-half semester course for freshman dairy technology majors.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Averill.

Food Technology S-4. (Special Products) II.

The class and laboratory exercises in this course are planned to meet the needs of students majoring in dairy technology. General principles of food preservation and their application to the subject of dairying are discussed in class exercises. Crushed fruits, fruit juices, syrups, flavored syrups and other products which are utilized in the dairy trade are manufactured and tested.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Levine.

Food Technology S-5. (Food Manufacturing) I.

Class work consists of study and laboratory exercises on phases of the food industry of major interest to the students. The studies include food preservation methods, manufacture of carbonated beverages, pickled products, confectionery production and commercial bakery procedures and operations. Some field trips to local commercial food plants will be made.

1 class hour and 1 4-hour laboratory period a week. Credit, 3.

Mr. Levine.

General Mathematics S-1. I.

This course provides a thorough drill in those fundamentals which are used in practical arithmetic. Fractions, ratio and proportion, percentage, formulas of area and volume, graphs, logarithms, and the use of the slide rule will be studied.

2 class hours a week. Credit, 2.

The Department.

Nutrition S-3. (Elementary Nutrition) I.

A general survey of the fundamental principles on which the normal person may plan an adequate dietary. It includes a study of the nutritive value of foods so as to make wise selection possible.

2 class hours a week. Credit, 2.

Mrs. Cook.

Practical Science S-7 and S-8. I. II.

A course in applied sciences, chiefly in the fields of chemistry and physics, as they are tools serving the needs of the food and dairy industries. In general, the course is designed to give an introduction to scientific thought and phenomena by means of lectures, textbook study and classroom demonstrations. The emphasis is entirely built around the practical problems in the student's field of work. Practical Science S-8 is a full semester course for food management majors.

2 class hours and 1 2-hour laboratory period a week. Credit, 3.

Mr. Lambert.

Public Speaking S-1 and S-2. I. II.

The aim of the course is to give the student some knowledge and practice in the more practical types of public speaking.

1 class hour a week. Credit, 1.

The Department.

Review Mathematics S-3. I.

A course intending to bring into sharp focus the simple mathematics which is used in vocational forestry and without which such forestry cannot be intelligently practiced. Arithmetic, plane geometry and certain vocational uses of trigonometry are taught.

3 class hours a week. Credit, 3.

The Department.

Veterinary Science S-1. I.

For animal husbandry and dairy technology majors. Conservation of the health of animals is the keystone of successful animal husbandry.

Animal Husbandry: This course acquaints students with the causes, development, control, eradication, and prevention of diseases common to cattle, sheep, swine, and horses.

Dairy Technology: Content of this course is restricted to dairy cattle, and considers normal structure and function of the various body systems, methods in disease control, and diseases which directly affect the milk supply and the public health.

3 class hours a week. Credit, 3.

Mr. Smith.

Veterinary Science S-1 and S-2. I. II.

For poultry husbandry majors. Students in the first semester will be concerned with the anatomy and physiology of poultry, and hygienic measures applicable to poultry management.

The second semester will cover the causes, development, control, eradication, and prevention of diseases of economic importance to the poultry industry.

3 class hours a week. Credit, 3.

Mr. Bullis.

SHORT COURSES AT THE UNIVERSITY OF MASSACHUSETTS

Short courses are based on the idea that the motive which inspires study is the most significant factor in study itself, and that this motive rises when the student himself realizes he faces a problem that calls for a soluton. Therefore there is no age limit. Enrolled in short courses are the young and the old, the experienced and the inexperienced, the theoretical and the practical. In this grouping there is a value, since students learn from each other as well as from the instructors. Practically all Short Course students intend to make a direct application of the knowledge given. Hence the aim of Short Course work is to offer the largest amount of information and training in agricultural and horticultural lines in the shortest possible time. During the past thirty years Short Courses have served thousands of students in this Commonwealth, and the demand for these courses since the war has increased greatly due to both veteran and non-veteran demand.

DIRECTORY OF INFORMATION

A. The University

Those desiring University catalogs and other pamphlets giving full information relative to entrance requirements, courses of study, expenses, opportunities for student labor, and so forth, and those with questions regarding admission to the university, either to the freshman class or to advanced standing should address Marshall O. Lanphear, Registrar of the University of Massachusetts, Amherst, Mass.

B. The Graduate School

Questions relating to courses offered leading to the degrees of Master of Science and Doctor of Philosophy, admission and work required, should be addressed to Gilbert L. Woodside, Director of the Graduate School, University of Massachusetts, Amherst, Mass.

C. Short Courses

For information concerning the Short Course Units, write or apply to Fred P. Jeffrey, Director of Stockbridge School of Agriculture, University of Massachusetts, Amherst, Mass.

Please forward with your application the following: (1) a letter of recommendation from your high school principal; (2) a letter written in long hand giving your reasons for wanting to attend Stockbridge; (3) a transcript of your high school or preparatory school grades; and (4) the certificate of citizenship form to be found on the next page, if lower Massachusetts tuition rate is claimed.

FORM I

APPLICATION FOR ENROLLMENT IN THE STOCKBRIDGE SCHOOL OF AGRICULTURE

Name.....Date.....

City or Town..... Street..... State.....

Present Occupation..... Age.....

School or College Attended:

Name of School.....Years in High School? ..... Graduate ? .....

Place.....Are you a Veteran trainee ?.....

Indicate by a check mark the course in which you desire to register. Do not check more than one.

1. Animal Husbandry
2. Arboriculture
3. Dairy Technology
4. Floriculture
5. Food Management
6. Forestry
7. Fruit Growing
8. Ornamental Horticulture
9. Poultry Husbandry
10. Turf Maintenance
11. Vegetable Growing

References.—I am personally acquainted with the above applicant, and know ..... to be of good moral character, industrious, studious, and physically capable.

1. Name..... Position.....

   Zddress.....

2. Name..... Position.....

   Address.....

(Two references are required and should not be members of your own family. Your teacher, your neighbor, or a former employer, are desirable. These persons should sign the application themselves.)

Mail this blank to FRED P. JEFFREY, Director of Short Courses.
UNIVERSITY OF MASSACHUSETTS, AMHERST, MASS.

Important.—Be sure to file citizenship certificate if State tuition rate is claimed.

The University of Massachusetts charges a tuition fee of $200 a semester to students who are not residents of Massachusetts. In order to satisfy the University authorities that an applicant is entitled to state tuition of $50 a semester, they require a statement signed by the clerk of the city or town in which the applicant resides, certifying to the fact that the parent or guardian of the applicant is a legal resident of said city or town. Where the guardian is certifying to this statement, it will be necessary for him to furnish copies of his appointment by the court. Such a statement may be made on the form below. If this is not presented when the student registers, the Treasurer has no option but to collect tuition on the above basis. When requesting the City Clerk to sign this certificate, an applicant for admission to the University should give the name and address of the parent or legal guardian unless he himself is of legal age.

FORM II

CERTIFICATE OF CITIZENSHIP

This is to certify that I am the father..... mother..... legal guardian

.....of.....
Student's Name

Signed.....

This is to certify that on the date specified below (Insert name of parent or guardian)

.....is a legal resident of.....
Parent's Name

....., Massachusetts.
Town or City

Signed.....
Town or City Clerk

Date.....

Mail this blank to FRED P. JEFFREY, Director of Short Courses

UNIVERSITY OF MASSACHUSETTS, AMHERST, MASS.

This certificate must be filed with application blank if lower tuition rate for citizens of Massachusetts is to be secured.

University of Massachusetts

Tuition Expenses

As a state institution, the University of Massachusetts offers a low rate of tuition to all students entering from the Commonwealth. Eligibility for admission under the low residential rate is determined in accordance with the following policy established by the Board of Trustees.

1. A student must present evidence satisfactory to the treasurer of the University that his domicile is in the Commonwealth of Massachusetts in order to be considered eligible to register in the University as a resident student. This means that he must have established a bona fide residence in the Commonwealth with the intention of continuing to maintain it as such.

2. The domicile of a minor shall follow that of the parents unless such minor has been emancipated. In case of emancipation, the student in addition to the requirements of these regulations respecting residence shall present satisfactory proof respecting emancipation. Minors under guardianship shall be required to present in addition to the certification of the domicile of the guardian, satisfactory documentary evidence of the appointment of the guardian.

3. No student shall be considered to have gained residence by reason of his attendance in the University nor shall a student lose residential preference during his continuous attendance at the University.

4. The residence of a wife shall follow that of the husband.

5. The prescribed form of application for classification as to residence status must be executed by each student. Misrepresentation of facts in order to evade the payment of out-of-state tuition shall be considered sufficient cause for suspension or permanent exclusion from the University.

6. Discretion to adjust individual cases within the spirit of these rules is lodged with the President of the University.

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